FOR OFFICIAL USE ONLY.

Vol. 12. No. 9. pp. 437-478. September, 1942

THE VETERINARY BULLETIN

1942

IMPERIAL BUREAU OF ANIMAL HEALTH INSTITUTE
2 SEPT 1942

IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Price 5/- net Annual Subscription £2

Imperial Agricultural Bureaux.

EXECUTIVE COUNCIL

SHAMALDHARI LALL, C.I.E., I.C.S., Officiating High Commissioner, *Chairman*	India and Burma.
J. A. CALDER, C.M.G., *Vice-Chairman*	Colonies, Protectorates and Mandated Territories.
Sir DONALD FERGUSSON, K.C.B.	United Kingdom.
Vacant	Canada.
F. L. McDOUGALL, C.M.G.	Australia.
F. J. DU TOIT	Union of S. Africa.
NEVILL L. WRIGHT, F.I.C., D.I.C.	New Zealand.
J. M. ADAMS, F.R.C.Sc.(I)	Eire.
D. JAMES DAVIES, C.B.E.	Newfoundland.
W. C. ROBERTSON	Southern Rhodesia.
Sir DAVID CHADWICK, K.C.M.G., C.S.I., C.I.E.	Secretary.

STAFF OF IMPERIAL BUREAU OF ANIMAL HEALTH, WEYBRIDGE

Director :

T. DALLING, M.A., M.R.C.V.S.

Deputy Director and
Editor of The Veterinary Bulletin and of Index Veterinarius :

W. A. POOL, M.R.C.V.S.

Second Officer :

J. TWEEDALE EDWARDS, M.R.C.V.S.

Assistants :

RUTH ALLCROFT, B.Sc., Ph.D.

G. EIRA JONES, B.A.

MOYA RIMINTON.

ENID M. SMEDLEY, M.Sc.

CONTENTS

[Most subjects are referred to below. Readers are recommended, however, to search the text of abstracts for items of restricted interest. Information on many diseases may be found in various sections, such as Immunity, Therapeutics, etc.]

DISEASES CAUSED BY BACTERIA AND FUNGI, **437–442.**

Strangles, **437**; Mastitis, **437**; Anthrax, **438**; Tuberculosis, **438**; Coli bacteria, **439**; Swine erysipelas, **439**; Pasteurella infection, **439**; Salmonella infection, **439**; Brucella infection, **440**; Anaerobic infection, **442.**

DISEASES CAUSED BY PROTOZOAN PARASITES, **442-444.**

Trypanosomiasis, **442**; Trichomoniasis, **443**; Leishmaniasis, **443**; Coccidiosis, **443**; Piroplasmosis, **443**; Plasmodium infection, **443**; Leptospirosis, **444.**

DISEASES CAUSED BY VIRUSES AND RICKETTSIA, **444-449.**

Foot and mouth disease, **444**; Ephemeral fever, **445**; Swine fever, **445**; Equine infectious anaemia, **445**; Equine encephalomyelitis, **446**; Rabies, **447**; Aujeszky's disease, **447**; Dog distemper, **447**; Influenza, **447**; Vaccinia, **448**; Rabbit papilloma, **448**; Rickettsiasis, **448.**

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS (INCLUDING FOWL PARALYSIS), **449-450.**

IMMUNITY, **451-453.**

Tuberculin, **451**; Serodiagnosis (brucellosis), **451**; Serodiagnosis (tularaemia), **451**; Immunological reactions, **451**; " Nephrotoxin ", **453**; Collodion particle agglutination, **453**; Shwartzman phenomenon, **453.**

PARASITES IN RELATION TO DISEASE [GENERAL], **454.**

PARASITES IN RELATION TO DISEASE [ARTHROPODS], **454-455.**

Botflies, **454**; Ticks, **454**; Tick paralysis, **454**; Scabies, **454.**

PARASITES IN RELATION TO DISEASE [HELMINTHS], **455-457.**

Cestodes, **455**; Nematodes, **455**; Resistance to Helminths, **457.**

DISEASES, GENERAL, **457-459.**

Game animals in relation to disease in Africa, **457**; Wastage in dairy herds, **457**; Calf diseases in Denmark, **458**; Keratitis in cattle, **458**; Equine periodic ophthalmia, **458**; Equine myopathy, **458**; Equine " liver and brain disease " in Finland, **458**; Equine interstitial hepatitis, **458**; " Summer sores ", **458**; Swine enteritis, **459**; Genital diseases (cattle), **459**; Osteohaemochromatosis (pigs), **459**; Purpura, **459**; Poultry diseases, **459**; Diseases of game animals, **459**; Cerebrosides, **459**; Chemistry of infectious diseases, **459.**

NUTRITIONAL AND METABOLIC DISORDERS, **460-464.**

Fat deficiency in rats, **460**; Relation of diet to nitrogen content of urine and to cholesterin and acetone body content of blood of goats, **460**; Hypocalcaemia and tetany (cattle), **460**; Potassium requirement of pigs, **460**; Myocardial lesions from dietary deficiency, **460**; Trace elements, **460-461**; Cobalt deficiency and pining, **461**; Vitamin requirements (race horses), **461**; Vitamins (general) **461**; Vitamins (cattle), **461**; Vitamin A (farm animals), **461**; Vitamin A (nervous system), **462**; Malformations and maternal nutritional deficiency, **462**; Dystrophy and vitamin E, **462**; Vitamin K, **462**; Vitamin B_1, **462**; Chastek paralysis in foxes and vitamin B_1, **462**; Vitamin B complex, **462**; Nicotinic acid and coenzyme in blacktongue, **462-463**; Pantothenic acid in pig and rat nutrition, **463**; Relation of water metabolism to porphyrin incrustations in pantothenic acid deficient rats, **463**; Anaemia in dogs and pyridoxin deficiency, **463**; Pyridoxin deficiency in rats, **463**; Biotin and scaly dermatosis (chick), **463**; " Spectacled eye " (rats) and biotin, **463.**

PHYSIOLOGY, **464-466.**

Histology of mammary gland, **464**; Teat sphincter of mammary gland, **464**; Semen (bull), **464**; Survival of spermatozoa (equine), **464**; Sexual periodicity, **464**; Oestrus in cows, **465**; Blood chemistry in oestrus, **465**; Oestrus in sheep, **465**; Embryology of teeth of cattle, **465**; Flora and fauna of rumen (cattle), **465**; Blood platelets (domestic animals), **465**; Ether-soluble acids of gastro-intestinal contents of sheep, **465**; Blood sugar (horse), **465**; Lactic acid oxidation quotient of brain of normal and B_1 deficient birds, **466**; Action of ascorbic acid on heart, **466**; Vitamin C and phosphatase in formation of callus, **466.**

POISONS AND POISONING, **466-467.**

Lead poisoning, **466**; Toxicity of sulphonamides, **466**; Phenothiazine poisoning (pigs), **466-467**; Photosentization in cattle caused by " *Holocalyx glaziovii* ", **467**; Effect of poison gas on eyes, **467.**

THERAPEUTICS, **468-472.**

Control of haemorrhage by oxalic acid, **468**; Testosterone implantation in geldings, **468**; Stilboestrol dipropionate in cattle practice, **468**; Nymphomania in cows, **468**; Calcium gluconate for equine tetanus, **468**; Sexocretin for anaphrodisia (sheep), **468**; Economy in bactericides, **468**; Halogenized phenols in disinfectants, **468**; New antiseptics, **469**; Anti-bacterial compounds, **469**; Chemotherapy of anaerobic infection, **469**; Synergistic action of sulphonamide compounds and azochloramid on pathogenic bacteria, **469**; Sulphonamides, **469**; Action of sulphonamides, sulphones and related phosphorus compounds in tuberculosis, **469**; Action of sulphanilyl-guanidine on salmonella, **469**; Sulphaguanidine in enteric infections (dog and goat), **470**; Sulphapyridine in lung diseases (sheep), **470**; Sulphonamide preparations for bacterial diseases of animals, **470**; Mode of action of sulphanilamide, **470**; sulphonamide compounds in faeces, **470**; Anthelmintic action

of arecoline hydrobromide on *Echinococcus granulosus*, **470**; Anthelmintic action of phenothiazine, **470**; Dosage of phenothiazine (lambs), **470**; Effect of phenothiazine in sheep, **471**; Ficin, **471**; 4 : 4′-Diamidino diphenyl ether (M & B 736) in canine babesiasis, **471**; Atebrin and 4 : 4′-Diamidino stilbene in mouse and trypanosomes, **471**; Acriflavine in "*Giardia* Infection", **471**; Chemotherapy of equine piroplasmosis, **471**; Hyperthermy treatment for equine encephalomyelitis, **471**.

PUBLIC HEALTH, **472**.

Milk-borne diseases in Massachusetts, **472**; Micro-organisms in simulated room environments, **472**.

TECHNIQUE AND APPARATUS, **472-474**.

Fluorescence microscopy, **472**; Cultivation of anaerobes, **473**; Blood sedimentation rate (equine), **473**; Cerebrospinal fluid (sheep), **473**; Test for blood compatability, **473**; Hard pallet impressions for identification of horses, **473**; Liver biopsy (horse and cattle), **473**; Artificial insemination (sheep), **474**; Dosage for particulate material (mice), **474**.

MISCELLANEOUS, **474-475**.

Science and world order. Report of British Association for Advancement of Science, **474**; Veterinary service in U.S.A. and defence effort, **474**; The domestic buffalo, **474**; XIIth plenary session of veterinary section of Academy of Sciences, U.S.S.R., **475**; Veterinary research station at Piatigorsk, **475**.

REPORTS, **475-477**.

Canada, **475-476**; Basutoland, **476**; Northern Rhodesia, **476**; Philippine veterinary association, **477**.

BOOK REVIEWS, **477-478**.

Spontaneous and experimental leucaemia in animals (Engelbreth-Holm), **477**; Sternal puncture (Piney), **477**; Lymphatics, lymph, and lymphoid tissue (Drinker & Yoffey), **475**; New paths in genetics (Haldane), **478**.

In order to economise in the use of paper, the *Veterinary Bulletin* is now printed in smaller type and with deeper and wider columns. There has been no reduction in the number of abstracts.

Bulletins on disease subjects written for farmers and "popular" articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature, are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin*.

TECHNICAL REVIEWS

(1) **"Antibacterial Agents derived from Micro-Organisms."**

(2) **"The Present Position of Phenothiazine as an Anthelmintic."**

Reprints (price 1/– and 1/6 respectively) obtainable from :– Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

Abonyi, L., 447.
Ackert, J. E., 457.
Advanc. Sci., 474.
Ajó, C., 453.
de Almeida, W. F. See Pereira, C., jt. author, 442.
•Altara, I., 468.
Andrews, J. C., & Cornatzer, W. E., 471.
Andrus, W. DeW., 462.
Angevine, D. M., & deGara, P. F., 453.
Ansbacher, S., & Landy, M., 463.
—. See also Martin, G. J., jt. author, 462.
Anthony, D. J., 456.
Antopol, W., Lehr, D., Churg, T., & Sprinz, H., 466.
Armstrong, A. R., & Rae, M. V., 469.
Artemova, A. I. See Rastegaeva, A. M., et al., jt. authors, 445.
Atkinson, W. B. See Figge, F. H. J., jt. author, 463.
•Ayoub, M. H., 465.

•Babskij, A. A. See Barinstein, L. A., jt. author, 473.
Baker, F., 465.
Baladad, A. E., & Gomez, A. K., 468.
•Barinstein, L. A., & Babskij, A. A., 473.
Barron, N. S., 441, 461.
Basutoland. Rep. vet. Livestk Div., 1939-40, 476.
Beach, B. A. See Ferguson, L. C., et al., jt. authors, 440.
Beltran, E., & Larenas, R., 444.
Benbrook, E. A. See Runnels, R. A., jt. author, 449.
Bessey, D. A. See Wolbach, S. B., jt. author, 461.
Bett, H. D. See Schnitzer, R. J., et al., jt. authors, 467.
Bickerton, R. E., 467.
Bielschowsky, F. See Green, H. N., jt. author, 470.
Blazhevich, I. V., 440.
Bloch, F. See Nitti, F., jt. author, 469.
Bolchenkova, N. G., 440.
Boivin, A., 440.
Boley, L. E. See Thorning, W. M., et al., jt. authors, 466.
Bornstein, S., & Strauss, L., 469.
Boyer, L. B. See Rose, H., Jr., jt. author, 459.
Breed, F., 459.
Brit. med. J., 468.
Brody, S., & Kibler, H. H., 465.
Brookman, B. See Hammon, W. McD., et al., jt. authors, 446.
Brown, J. W., Eaton, M. D., Meiklejohn, G., Lagen, J. B., & Kerr, W. J., 447.
Bryan, A. H., 470.
Buchbinder, L., & Phelps, E. B., 472.
—, Solowey, M., & Phelps, E. B., 472.
—. See also Phelps, E. B., jt. author, 472.
•Büker, W., 449.
Burk, D. See du Vigneaud, V., et al., jt. authors, 450.
Burke, H. E., 438, 439.
Burnet, F. M. See Mackerras, I. M., et al., jt. authors, 445.
Buxton, P. A., 465.
Byrne, J. L., 439.

Canada. Rep. Anim. Path. Div., Nova Scotia, 1939, 476.
—. Rep. Dep. Agric., Brit. Columbia, 1940, 475.
—. Rep. Minist. Agric., 1938-39, 475.
Cannon, C. Y. See Espe, D., jt. author, 464.
Cano, A. E. See Mata, E. G., jt. author, 465, 474.
Caraza Palacios, H. See Meneses Hoyos, J., jt. author, 466.
Carlson, W. E. See Evans, C. A., et al., jt. authors, 462.
Carmichael, J., 471.
—, & Fiennes, R. N. T.-W., 449.
Carpenter, C. R., & Krakower, C. A., 438.
•Cassamagnaghi, A., 439.
Cassells, R. W., & Lamont, H. G., 447.
Chambers, L. A. See Henle, W., jt. author, 447.
Chavarria, C., 454.
Christianson, O. O., 459.
Christopher, G. L. See Crossley, M. L., et al., jt. authors, 459.
Churg, T. See Antopol, W., et al., jt. authors, 466.
Cobbett, N. G., & Mitchell, W. C., 454.
Coggeshall, L. T., 443.
Coombes, A. I. See Spitzer, E. H., et al., jt. authors, 462.
Cooper, F. B. See Gross, P., et al., jt. authors, 466.
Cornatzer, W. E. See Andrews, J. C., jt. author, 471.
Corner, H. H., 461.
Coronel, A. B. See Topacio, T., jt. author, 438.
Coulston, F., & Manwell, R. D., 444.
Crook, E. M., 452.
Crossley, M. L., Kienle, R. H., Vassel, B., & Christopher, G. L., 459.
—, Vassel, B., & Christopher, G. L., 459.
Crowhurst, F. A., 441.
Csontos, J., & Sályi, G., 458.
Culbertson, J. T., 471.
•Cutinelli, C., 439.

Daniel, E. P., Kline, O. L., & Tolle, C. D., 463.
Dann, W. J., & Handler, P., 462.
D'Apice, M. See Rodrigues, C., jt. author, 453.
Davis, G. E., 454.
Davydov, Y. I., 458.
Day, F. T., 464.
Derbedenev, I. P., Tselishcheva, L. M., & Omarov, K. S., 442.
Deschiens, R., & Renaudet, R., 455.
Dikmans, G. See Price, E. W., jt. author, 456.
Dimick, M. K. See Lepkovsky, S., et al., jt. authors, 463.
Dobler, M., 443.
Dougherty, R. W., & Ewalt, H. P., 464.
Drinker, C. K., & Yoffey, J. M., 478.
•Dunger, R., 458.
Durrieu, E., 469.

Eaton, M. D. See Brown, J. W., et al., jt. authors, 447.
Eisler, D. M., 453.
Elvehjem, C. A. See Henderson, L. M., et al., jt. authors, 463.
—. See also McKibbin, J. M., et al., jt. authors, 463.
—. See also Nielsen, E., jt. author, 463.
—. See also Spitzer, E. H., et al., jt. authors, 462.
Emmart, E. W. See Smith, M. I., et al., jt. authors, 469.
Engelbreth-Holm, J., 477.
Enigk, K., 449, 457.
Van Es., L., & Olney, J. F., 459.
Espe, D., & Cannon, C. Y., 464.
Evans, C. A., Carlson, W. E., & Green, R. G., 462.
Eveleth, D. F., Millen, T. W., & McNutt, S. H., 465.
Ewalt, H. P. See Dougherty, R. W., jt. author, 464.
Ewing, C. L. See Ransmeier, J. C., jt. author, 451.

Feemster, R. F., 472.
Ferguson, L. C., Irwin, M. R., & Beach, B. A., 440.
Fiennes, R. N. T.-W. See Carmichael, J., jt. author, 449.
Figge, F. H. J., & Atkinson, W. B., 463.
Filkov, N. S., 471.
Fitte, O. A., 441.
Flint, A. See Seelemann, M., jt. author, 437.
Fominykh, V. N., 458.
Fox, C. L., Jr. See Rose, H. M., jt. author, 469.
Frei, W., 442.
Friedewald, W. F., 448.
Fritzsche, K., 440.
Frost, D. V. See McKibbin, J. M., et al., jt. authors, 463.

Galvão, P. E., & Pereira, J., 466.
Gapuz, R. B., 454.
deGara, P. F. See Angevine, D. M., jt. author, 453.
Geiger, W. See Uhlenhuth, P., et al., jt. authors, 445.
Gelormini, N., 455, 470.
Gjullin, C. M. See Hammon, W. McD., et al., jt. authors, 446.
Götze, R., 457.
Golubev, I. E., 451.
Gomez, A. K. See Baladad, A. E., jt. author, 468.
Graham, R., & Levine, N. D., 447.
Grasset, E., 439.
Gray, D. F., & Hoeben, J. G. H., 442.
Gt. Britain. Rep. Brit. Ass. Advanc. Sci., 474.
Green, H. N., & Bielschowsky, F., 470.
Green, R. G. See Evans, C. A., et al., jt. authors, 462.
Greenberg, L., 473.
Greene, M. R. See Rosenfeld, W. D., jt. author, 444.
Gross, P., Cooper, F. B., & Morningstar, W. A., 466.
Gross, W. See Herzberg, K., jt. author, 447.
Guidry, W., 450.
Gusev, V. F. See Yakimov, V. L., et al., jt. authors, 471.

Hager, A., 455.
Haldane, J. B. S., 478.
Hammon, W. McD., & Izumi, E. M., 446.
—, Reeves, W. C., Brookman, B., Izumi, E. M., & Gjullin, C. M., 446.
Handler, P. See Dann, W. J., jt. author, 462.
Hastings, C. C., 461.
Hawking, F., 470.
—, & Smiles, J., 471.
Hegner, R., & West, E., 444.
Heidelberger, M., & Mayer, M., 452.
Henderson, J. A., 447.
Henderson, L. M., McIntire, J. M., Waisman, H. A., & Elvehjem, C. A., 463.
Henle, W., & Chambers, L. A., 447.
Henricson, T. See Hülphers, G., et al., jt. authors, 459.
van Herick, W. See Howitt, B. F., jt. author, 446.
Hershey, A. D., 452, *bis.*
Herzberg, K., 447.
—, & Gross, W., 447.
Hetze, A. G. See Mongiardino, R. A., jt. author, 445.
Hoeben, J. G. H. See Gray, D. F., jt. author, 442.
Hökl, J. See Lenfeld, J., jt. author, 438.
•Holth, H., 440.
Hopfengärtner, M., 439.
Howell, N. G., 456.
Howitt, B. F., & van Herick, W., 446.
Hrabik, E., 451.
Hsü, H. F., & Li, S. Y., 455.
Huddleson, I. F. See Ruhland, H. H., jt. author, 441.
Hülphers, G., Lilleengen, K., & Henricson, T., 459.
Huff, C. G., 443.
Hughes, E. H., 463.
—, & Ittner, N. R., 460.
Hume, E. M. See Smedley-Maclean, I., jt. author, 460, *bis.*

Illényi, A., & Kenessey, S., 442.
Ingle, R. T. See Schofield, F. W., jt. author, 439.
Irwin, M. R. See Ferguson, L. C., et al., jt. authors, 440.
Isaksson, A., & Jonsson, G., 473.
Ithurrat, E. M. F., 441.
Ittner, N. R. See Hughes, E. H., jt. author, 460.
Izumi, E. M. See Hammon, W. McD., jt. author, 446.

•Jármai, K., 459.
Jeppsson, H., & Magnusson, H., 437.
Jolliffe, N., 462.
•Jonientz, F., 465.
Jonsson, G. See Isaksson, A., jt. author, 473.

Karneeva, V. E. See Orlov, E. S., jt. author, 441.
Kearns, W. M., 468.
Kelser, R. A., 474.
Kenessey, S. See Illényi, A., jt. author, 442.
Kensler, C. J. See du Vigneaud, V., et al., jt. authors, 450.
Kerr, W. J. See Brown, J. W., et al., jt. authors, 447.
Kety, S. S., 466.
Kibler, H. H. See Brody, S., jt. author, 465.
Kidd, J. G. See Rous, P., jt. author, 449.
Kienle, R. H. See Crossley, M. L., et al., jt. authors, 459.
Kleckner, A. L., 437.
Kleinenberg, H. E., Neufach, S. A., & Shabad, L. M., 450.
Kline, O. L. See Daniel, E. P., et al., jt. authors, 463.
Kochetkov, A. V., 443, 455.
Krakower, C. A. See Carpenter, C. R., jt. author, 438.
Krause, M. E. See Lepkovsky, S., et al., jt. authors, 463.

Lagen, J. B. See Brown, J. W., et al., jt. authors, 447.
Lamont, H. G. See Cassells, R. W., jt. author, 447.

Landy, M. See Ansbacher, S., jt. author, 463.
Larenas, R. See Beltran, E., jt. author, 444.
Lawler, H. J., 455.
Legg, J., & Maunder, J. C. J., 451.
Lehr, D. See Antopol, W., et al., jt. authors, 466.
Leiper, J. W. G., & Peters, B. G., 471.
—. See also Peters, B. G., jt. author, 470.
Lenfeld, J., & Hökl, J., 438.
Lepkovsky, S., Krause, M. E., & Dimick, M. K., 463.
*Levi, M. L., 448.
Levine, N. D. See Graham, R., jt. author, 447.
Lewis, S. R. See Nungester, W. J., jt. author, 451.
Li, S. Y. See Hsü, H. F., jt. author, 455.
Lilleengen, K. See Hülphers, G., et al., jt. authors, 459.
Livingston, P. C., & Walker, H. M., 467.
Loeb, L., & Suntzeff, V., 450.
Lyle, T. K., 467.

MacGregor, J. J., 457.
Macgregor, R., 474.
McIntire, J. See Henderson, L. M., et al., jt. authors, 463.
Mackerras, I. M., Mackerras, M. J., & Burnet, F. M., 445.
Mackerras, M. J. See Mackerras, I. M., et al., jt. authors, 445.
McKibbin, J. M., Schaefer, A. E., Frost, D. V., & Elvehjem, C. A., 463.
McNutt, S. H. See Eveleth, D. F., et al., jt. authors, 465.
Magnusson, H. See Jeppsson, H., jt. author, 437.
Manson-Bahr, P., 470.
Manwell, R. D. See Coulston, F., jt. author, 444.
Marshall, F. H. A., 464.
Martin, G. J., & Ansbacher, S., 462.
Martin-Poggi, R. See Roche, J., jt. author, 466.
Mata, E. G., & Cano, A. E., 465, 474.
Maunder, J. C. J. See Legg, J., jt. author, 451.
Mayer, M. See Heidelberger, M., jt. author, 452.
Meiklejohn, G. See Brown, J. W., et al., jt. authors, 447.
*Mejlbo, E., 458.
Meneses Hoyos, J., & Caraza Palacios, H., 466.
Miessner, H. See Uhlenhuth, P., et al., jt. authors, 445.
Millen, T. W. See Eveleth, D. F., et al., jt. authors, 465.
Milovidov, V. S., 451.
Mingoja, Q., 469.
Mitchell, C. A., & Walker, R. V. L., 446.
Mitchell, W. C. See Cobbett, N. G., jt. author, 454.
Mitscherlich, E., 448, *ter*.
Mongiardino, R. A., & Hetze, A. G., 445.
Morningstar, W. A. See Gross, P., et al., jt. authors, 466.
Morrill, C. C. See Thorning, W. M., et al., jt. authors, 466.
Morris, J. P. A., 476.
Morris, M. C., 451, *bis*.
Müller, O., 470.
Mylon, E. See Thomas, R. M., et al., jt. authors, 460.

Neame, H., 467.
Nelson, R. C. See Workany, J., jt. author, 462.
Neter, E., 469.
Neufach, S. A. See Kleinenberg, H. E., et al., jt. authors, 450.
Nielsen, E., & Elvehjem, C. A., 463.
Nikitin, N. A., 473.
Nitti, F., & Bloch, F., 469.
N. Amer. Vet., 444, 446.
N. Rhodesia. Rep. vet. Dep., 1940, 476.
Nungester, W. J., & Lewis, S. R., 451.
Nunn, L. C. A. See Smedley-Maclean, I., jt. author, 460.

Ohama, S., 457.
Oldham, J. N., & White, E. G., 456.
Olney, J. F. See Van Es., L., jt. author, 459.
Omarov, K. S. See Derbedenev, I. P., et al., jt. authors, 442.
Oppermann, M., 468.
Orlov, E. S., & Karneeva, V. E., 441.
Orr, J. H. See Reed, G. B., et al., jt. authors, 442.
Oyuela, A. M., 460.

Pappenheimer, A. M., 462.
*Pavlov, P., 454.
Pelevin, V. K. See Yakimov, V. L., et al., jt. authors, 471.
Penha, A. M., 445.
Pereira, C., & de Almeida, W. F., 442.
Pereira, J. See Galvão, P. E., jt. author, 466.
Peters, B. G., & Leiper, J. W. G., 470.
—. See also Leiper, J. W. G., jt. author, 471.
Phelps, E. B., & Buchbinder, L., 472.
—. See also Buchbinder, L., jt. author, 472.
—. See also Buchbinder, L., et al., jt. authors, 472.
Philippine Is. Rep. 24th Congr. vet. med. Ass., 477.
Phillips, T. J., 467.
Piney, A., 477.
Pollard, M., 440.
Prat, P. L. A., 470.
Price, E. W., & Dikmans, G., 456.

*Queisser, J., 459.
Quevedo, J. M., 441.
*Quiroga, S. S., & Schang, P. J., 445.
Quortrup, E. R., & Shillinger, J. E., 459.

Rae, M. V. See Armstrong, A. R., jt. author, 469.
Ransmeier, J. C., & Ewing, C. L., 451.
Rastegaeva, A. M., Sirotkin, V. A., & Artemova, A. I., 445.
Rea, L., 467.
Reed, G. B., Orr, J. H., & Smith, D., 442.
Reeves, W. C. See Hammon, W. McD., et al., jt. authors, 446.
Renaudet, R. See Deschiens, R., jt. author, 455.
Rhoads, C. P. See du Vigneaud, V., et al., jt. authors, 450.
Riglos, A., 451.
Rocha e Silva, M., 467.
Roche, J., & Martin-Poggi, R., 466.
Rodrigues, C., & D'Apice, M., 453.
Rose, H., Jr., & Boyer, L. B., 459.
Rose, H. M., & Fox, C. L., Jr., 469.
Rose, V. T., 458.
Rosenfeld, W. D., & Greene, M. R., 444.
Rossi, F., 438.
*Roth, H., 456.
Rous, P., & Kidd, J. G., 449.
Rubino, M. C., 443.
Ruhland, H. H., & Huddleson, I. F., 441.
Runnells, R. A., & Benbrook, E. A., 449.
Rusoff, L. L., 460.

Sályi, G. See Csontos, J., jt. author, 458.
Sarre, H., & Wirtz, H., 453.
Sarrett, H. P., & Stenhouse, M., 463.
Schaefer, A. E. See McKibbin, J. M., et al., jt. authors, 463.
*Schang, P. J. See Quiroga, S. S., jt. author, 444.
Schermer, S., 442.
*Schley, H., 473.
Schlotthauer, C. F., 446.
Schmidt, H. W., 455, *bis*.
*Schmidt, S., 444.
Schnitzer, R. J., Siebermann, C., & Bett, H. D., 467.
Schofield, F. W., & Ingle, R. T., 439.
Schoop, 454.
Seelemann, M., & Flint, A., 437.
Shabad, L. M. See Kleinenberg, H. E., et al., jt. authors, 450.
Shillinger, J. E. See Quortrup, E. R., jt. author, 459.
Siebermann, C. See Schnitzer, R. J., et al., jt. authors, 467.
Siegfried, T. See Spuhler, V., jt. author, 466.
Sirotkin, V. A. See Rastegaeva, A. M., et al., jt. authors, 445.
Smedley-Maclean, I., & Hume, E. M., 460, *bis*.
—, & Nunn, L. C. A., 460.
Smiles, J. See Hawking, F., jt. author, 471.
Smith, D. See Reed, G. B., et al., jt. authors, 442.
Smith, M. I., Emmart, E. W., & Westfall, B. B., 469.
Sobolev, I. A., 475.
Solis, J. A., 473.
Solowey, M. See Buchbinder, L., et al. jt. authors, 472.
*Sonnenschein, E., 465.
Sopeña, I., 465.
Spangler, J. M. See du Vigneaud, V., et al., jt. authors, 450.
Spitzer, E. H., Coombes, A. I., Elvehjem, C. A., & Wisnicky, W., 462.
Spratling, F. R., 441.
Sprinz, H. See Antopol, W., et al., jt. authors, 466.
Sprunt, D. H., 448.
Spuhler, V., & Siegfried, T., 466.
Stapleton, S. F., 468.
Startsev, I. S., 438.
Steck, W., 473.
Stenhouse, M. See Sarrett, H. P., jt. author, 463.
Stenius, P. I., 458.
*Sterk, G., 438.
Strauss, L. See Bornstein, S., jt. author, 469.
Strong, L. C., 450, *bis*.
*Stubinger, K. H., 473.
*Suermann, J., 460.
Sugiura, K. See du Vigneaud, V., et al., jt. authors, 450.
Suntzeff, V. See Loeb, L., jt. author, 450.
Swanson, E. W., & Turner, C. W., 464.

Tarasov, I. A., 475.
Taylor, E. L., 456.
Thomas, R. M., Mylon, E., & Winternitz, M. C., 460.
Thorning, W. M., Morrill, C. C., & Boley, L. E., 466.
Threlkeld, W. L., 456.
*Török, J., 465.
Tolle, C. D. See Daniel, E. P., et al., jt. authors, 463.
Topacio, T., & Coronel, A. B., 438.
Torres, C. M., 443.
Trautwein, K., 440.
Travis, B. V., 454.
Tselishcheva, L. M. See Derbedenev, I. P., et al., jt. authors, 442.
Turner, C. W. See Swanson, E. W., jt. author, 464.

Uhlenhuth, P., Miessner, H., & Geiger, W., 445.

Vassel, B. See Crossley, M. L., et al., jt. authors, 459.
Vet. Rec., 468.
*Vianello, G., 445.
du Vigneaud, V., Spangler, J. M., Burk, D., Kensler, C. J., Sugiura, K., & Rhoads, C. P., 450.

Waisman, H. A. See Henderson, L. M., et al., jt. authors, 463.
Walker, 467.
Walker, H. M. See Livingston, P. C., jt. author, 467.
Walker, R. V. L. See Mitchell, C. A., jt. author, 446.
Wallace, F. G., 474.
Way, C., 461.
Wehmeyer, P., 452.
Wesselinoff, W., 440.
West, E. See Hegner, R., jt. author, 444.
Westfall, B. B. See Smith, M. I., et al., jt. authors, 469.
White, E. G. See Oldham, J. N., jt. author, 456.
Whiting, M. H., 467.
Whitney, L. F., 447.
Williams, R. J., 461.
Williams, R. R., 461.
Winternitz, M. C. See Thomas, R. M., et al., jt. authors, 460.
Wirtz, H. See Sarre, H., jt. author, 453.
Wisnicky, W. See Spitzer, E. H., et al., jt. authors, 462.
Wolbach, S. B., & Bessey, D. A., 461.
Workany, J., & Nelson, R. C., 462.
Wright, W. L., 461.

Yakimoff, V. L., 443.
—, Gusev, V. F., & Pelevin, V. K., 471.
Yoffey, J. M. See Drinker, C. K., jt. author, 478.
Yutuc, L. M., 442.

Zimmermann, W., 472.
Zondek, B., 468.

NOTE:—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 12.] September, 1942. [No. 9.

DISEASES CAUSED BY BACTERIA AND FUNGI

JEPPSSON, H., & MAGNUSSON, H. (1941). Spridning av kvarka genom betäckning (" Deckdruse "). **[Spread of Strangles by Copulation].**—*Svensk VetTidskr.* **46.** 178–181.

Strangles has increased in Sweden since 1939 owing to movement of military horses. The authors describe an outbreak of " bastard " strangles transmitted by copulation and characterized by abscess formation in the female genital tract, the udder, perineum and elsewhere. The mares involved, which had never had strangles, evinced symptoms about seven days after mating with an apparently healthy stallion which had once had strangles. The disease failed to spread to young horses grazing with two of the affected mares. The stallion was mated on 48 farms to 50 other mares of which four on three separate farms became affected, but again the disease did not spread to contact susceptible horses. The sucking foal of one affected mare developed typical strangles. Bacteriological examination of material from this and a coital abscess demonstrated the streptococci.—G. B. BROOK.

KLECKNER, A. L. (1942). **Microscopic Examination of Incubated Composite Milk Samples—a Rapid and Efficient Method for Detecting Streptococcus and Staphylococcus Infection of the Bovine Udder.**—*Vet. Ext. Quart. Univ. Pa.* No. 85. pp. 3–13.

K. reported [*V. B.* **12.** 327.] on a system of milk examination similar to that now described but using separate quarter samples from each cow. He now describes the results of testing 1,068 composite (mixed quarter) samples of milk from 133 cows previously found free of mastitis by regular examination of quarter samples by the blood-plate method and by microscopic examination of incubated samples. Twenty-seven showed streptococci and of these eight were saprophytic types, six *Str. agalactiae*, nine *Str. dysgalactiae*, and four *Str. uberis*. Repeat tests of infected cows by this method were all confirmatory. In three smaller herds similar results were obtained with an efficiency of 96·3% for streptococcal and 95·7% for staphylococcal infection as judged by blood-agar cultural tests.

The method consists of mixing equal quantities of quarter samples together, incubating them at 37°C. for 16–18 hours and then spreading a loopful of the milk within a marked 1 cm. square on a slide. This is then stained, defatted, and fixed with Neuman-Lampert stain, formula No. 2.—C. V. WATKINS.

SEELEMANN, M., & FLINT, A. (1941). Zur Herstellung und Auswertung präcipitierender Sera für die Streptokokkenbestimmung. I. Teil: Die hämolytischen Streptokokken der Gruppen A und C. II. Teil: Die Streptokokken der Gruppen B, D und L. **[Preparation and Evaluation of Precipitating Sera for the Differentiation of Streptococci. I. Haemolytic Streptococci of Groups A and C. II. Streptococci of Groups B, D and L].**—*Arch. wiss. prakt. Tierheilk.* **76.** 436–448, and **77.** 67–77.

I. Group-specific sera were prepared and details of methods used are given. Difficulty was experienced over non-group-specific reactions and details are given of the immunizing history of seven rabbits. It was sometimes found that, by bleeding the rabbits again ten days or more after the initial heart puncture, these non-group-specific reactions faded out and that by storing the serum for five months the same improvement sometimes resulted. Rabbits were also encountered which persistently remained negative or whose serum titre diminished after further vaccination.

With the group A serum 20 strains (all human) were typed. Biochemically all gave β haemolysis and were trehalose negative. With the group C serum 122 strains were identified, 120 being from a wide range of animal sources. Two rabbits were immunized with each of the four subgroups of group C. The serum of rabbits immunized with *Str. dysgalactiae* was type specific and failed to react with other group C strains, whereas the serum of rabbits immunized with the other subgroups of group C reacted with *Str. dysgalactiae* antigen. The sera remained potent for five months at least and it was found that formamide extracts kept for the same time.

II. The immunization history of eight rabbits vaccinated with *Str. agalactiae* is described. The best results were obtained by giving the serum-producing rabbits daily doses of formol vaccine for five consecutive days each week for a period of three weeks, blood being collected three days after the last dose; this is one of the methods used in I. No difficulty was encountered with non-group-specific reactions but relatively greater type specificity as opposed to group-embracing reactions occurred in the serum, and in certain rabbits that gave good group serum further vaccination diminished the serum titre except for the type species. The rabbits did not maintain a potent titre for as many days after bleeding as in groups A and C. Certain strains were found to be useless for immunization. Of 122 strains of *Str. agalactiae* tested, 116 could readily be assigned to group B by precipitin tests.

Group D serum was found to be relatively easier to produce : as in the work in I, continued vaccination again diminished serum titre in certain cases and some strains were markedly more suited for immunization than others. One rabbit immunized with a strain of *Str. liquefaciens* (which gave a precipitin reaction with group D serum as did 12 other similar strains) produced a serum entirely specific for the immunization strain, reacting with no other antigen.

Group L serum was found difficult to prepare, but 22 strains (all *Str. lactis*) were typed. One strain appeared to be particularly successful as antigen for immunization.

In conclusion, it was found possible to prepare sera of groups A, B, C, and D, which could type the great majority of streptococci which fell into these groups, but the preparation of potent serum was accompanied by certain difficulties in which several factors are concerned, *viz*, the rabbits used, the strains, and the method of immunization.—D. L. ROBARTS.

LENFELD, J., & HÖKL, J. (1941). Die biologischen Eigenschaften der Milch einer an chronischem Milzbrand des Euters erkrankten Milchkuh. **[The Biological Properties of Milk from a Cow with Chronic Anthrax of the Udder].**—*Z. Fleisch- u. Milchhyg.* **52.** 26–29.

After antiserum treatment for anthrax bacteraemia, a cow developed chronic anthrax mastitis. The milk was scanty, but of good appearance. When centrifuged, a heavy deposit of leucocytes and encapsulated anthrax bacilli was obtained. The milk contained $42–96 \times 10^6$ anthrax bacilli per ml. The clinical aspect of this case was described by FEDAK [(1933). *Zvěrolék. Obz.* **26.** 64].—J. G. CARR.

STARTSEV, I. S. (1939). Odnovremennye predokhranitel'nye privivki krupnogo rogatogo skota sibireyazvennoĭ glyukozidnoĭ vaktsinoĭ i formolvaktsinoĭ emkara. **Simultaneous Prophylactic Inoculation of Cattle with Anti-Anthrax Glucoside Vaccine and Blackleg Formol Vaccine].**—*Sovyet. Vet.* No. 4. pp. 29–30.

No losses occurred in 33,845 inoculated cattle, whereas in untreated animals on the same pastures the incidence of anthrax was 0·27% and that of blackleg 0·45%. S. recommends the wide application of this method.—A. MOLDAWSKY.

TOPACIO, T., & CORONEL, A. B. (1941). **Transmission of Tuberculosis in a Carabao by Cohabitation.**—*Philipp. J. Anim. Indust.* **8.** 387–388.

A short account of naturally acquired TB. in a water buffalo tied up in a byre between two experimentally infected water buffaloes which both died in about seven months ; the first buffalo was positive on tuberculin testing after six months of exposure and was used in a surra experiment which was concluded about three years later. On re-test the animal reacted to tuberculin and it died of generalized TB. shortly afterwards. The surra infection was considered to have brought on the fatal TB.—J. E.

*STERK, G. (1940). Zur Kenntnis der Tuberkulose beim Silberfuchs. **[TB. in the Silver Fox].**—*Inaug. Diss., Leipzig.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **48.** 382].

The infection is mostly alimentary and almost exclusively of the bovine type. P.M. examination shows that in addition to emaciation and pronounced icterus, there are in the lungs, kidneys, and intestines, multiple nodules and ulcers of various sizes. The mesenteric lymph nodes are enlarged, with caseation, but rarely any calcification. The cervical lymph nodes may be purulent and rupture into open ulcers on the neck. The appearance of the liver is reminiscent of yellow liver dystrophy. Tumour-like nodules are found in the mediastinum and spleen.

Histologically, it is found that in the silver fox anatomical changes are purely productive, with extensive cell proliferation. The deposition of fibrin and lymphocytes, characteristic of an exudative inflammation, is either lacking or else very much restricted. There is a typical growth of histiocytes, but few giant cells. The strong phagocytosis causes necrosis in the centre of the cell groups. The concentration of macrophages around infected foci indicates that the silver fox reacts to the bacillus as to intruding foreign bodies.

ROSSI, F. (1941). Tuberculosis aviária. Recopilación de estudios en la concentración municipal de aves y huevos de la ciudad de Buenos Aires. **[TB. of Domestic Fowls in the Argentine].**—*Gac. vet., B. Aires.* **3.** 167–183.

R. carried out 1,290 P.M. examinations on fowls and found that almost without exception tuberculous lesions were found only in birds over a year old. He reviews methods of *ante mortem* diagnosis and describes his technique of P.M. examination and the lesions found. There are a number of illustrations of lesions in various organs.—MILLER WATSON.

CARPENTER, C. R., & KRAKOWER, C. A. (1941). **Notes on Results of a Test for Tuberculosis in Rhesus Monkeys** (*Macaca mulatta*).—*Puerto Rico J. publ. Hlth.* **17.** 3–13. [In Spanish, pp. 14–25].

A description is given of preliminary work on control of TB. among the colony of wild rhesus monkeys on Santiago Island. Results are discussed of intrapalpebral injections of 0·025 mg. P.P.D. used for testing monkeys for shipment to the Island. 1·66% of 120 young animals tested in India reacted positively and after elimination of the reactors 100% gave negative reactions on arrival at the Island. Subsequent P.M observations showed that the P.P.D. test as used was about 95% reliable, but it is suggested that the test may not accurately detect all stages of TB. in monkeys. TB., dysentery, and fighting were the main causes of mortality in the colony during its first year on the Island.—R. ALLCROFT.

BURKE, H. E. (1940). **Tuberculosis in Rabbits. A Further Comparison of the Roentgenological and Pathological Findings in Primary and Reinfection Experimental Pulmonary Tuberculosis in Rabbits. Part I. Primary Tuberculosis.**—*Amer. Rev. Tuberc.* **42.** 343–375.

Fifty-five healthy six-month-old rabbits of uniform weight and fed on a constant, well balanced diet, were injected intratracheally under sodium amytal anaesthesia with 0·1–1·0 mg. of virulent bovine tubercle bacilli and killed after intervals of 13 days to 2½ years. Chest roentgenograms were made at daily, weekly, or monthly intervals, and sections of necropsy material, stained with haematoxylin and eosin or for tubercle bacilli, elastic tissue, and connective tissue, were examined microscopically. A review and comparison of the roentgenological and pathological findings demonstrated in striking manner the role of the number of invading micro-organisms in the pathogenesis of primary experimental pulmonary TB. and showed that large areas of tuberculous pneumonia may undergo a remarkable degree of resolution and that a rapidly progressive pulmonary TB. may arise from very minute residual foci. This " diphasic " nature of experimental TB. of rabbits has only once been previously noted. Six plates are appended giving comparative pulmonary roentgenograms and photomicrographs.—R. O. MUIR.

BURKE, H. E. (1940). **Tuberculosis in Rabbits. A Further Comparison of the Roentgenological and Pathological Findings in Primary and Reinfection Experimental Pulmonary Tuberculosis in Rabbits. Part II. Reinfection Experiments.**—*Amer. Rev. Tuberc.* **42.** 499–534.

Fifty-one rabbits were inoculated in the groin with 0·5–1·0 ml. of a heavy suspension of avirulent tubercle bacilli. Three weeks later they, and previously uninfected rabbits, were injected intratracheally with virulent bovine type tubercle bacilli, 22 receiving 0·1 mg., 18, 0·5 mg., and 11, 1·0 mg. Chest roentgenograms were made at frequent intervals, and some of the rabbits were allowed to die while the remainder were killed off at selected periods. It was found that while, in rabbits not previously infected, abnormal shadows did not appear in the chest films until some time between the 10th and 28th days after inoculation, such shadows could be regularly detected on the first day after intratracheal injection in those previously infected. In both classes (except in the case of a few of the vaccinated rabbits injected intratracheally with 0·1 mg. of bacilli) these first shadows disappeared and were followed later by new shadows. All rabbits which showed roentgenogram evidence of extension of disease died of generalized TB. within a few months, while those with the reinfection disease induced by a small dose of bacilli, which failed to show evidence of extension of disease, remained well for periods up to two years. Pathological findings closely followed those indicated by the roentgenogram. It was shown that the cause of the spread in reinfection disease is essentially the same as that which occurs in primary TB., in both cases the tubercle bacilli apparently escaping from minute tuberculous lesions in the walls of the bronchi or from the pulmonary cavities, and being carried, by way of the air passages, to other parts of the lung. The findings in the various groups of injected rabbits are described in detail, and excellent roentgenograms clearly indicate the changes which occur.—J. R. LAWSON.

*CUTINELLI, C. (1941). Gli acidi grassi nello sviluppo del bacillo di Koch. [**Utilization of Fatty Acids by Cultures of Tubercle Bacilli**].—*Arch. ital. Med. sper.* **8.** 487–492. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **141.** 166].

The tubercle bacillus can utilize stearic, capric, and heptylic acids to supply energy, but not for growth. Palmitic and oleic acids, which are constituents of the bacterial substance, have no influence on growth. If the glycerol of Sauton's medium is replaced by stearic, undecylic, capric, heptylic, lactic, or pyruvic acid, no growth occurs.—J. G. CARR.

*CASSAMAGNAGHI, A. (1939). La cutivacunación en las infecciones a bacilos de Preisz-Nocard. [**" Cuti-Vaccination " against Infection by** *Corynebacterium ovis*].—*J. Agron. vet., B. Aires.* p. 323. [Abst. from abst. in *Gac. vet., B. Aires.* **2.** 90].

C. used " cuti-vaccination " of g. pigs against *C. ovis*, using attenuated strains ; reasonable immunity was obtained. He hopes to be able to apply the same method to the immunization of sheep.—M. WATSON.

SCHOFIELD, F. W., & INGLE, R. T. (1941). **The Herd Diagnosis of Swine Erysipelas by the Use of Schoening's Plate Antigen.**—*Canad. J. comp. Med.* **5.** 287–288.

A litter of nine pigs had not done well since weaning. Three or four had enlarged joints and moved stiffly. The plate agglutination test was negative on a specimen brought for examination, but two weeks later autopsy showed the presence of *Erysipelothrix rhusiopathiae* in a hock joint. The remaining eight were then tested. Four were lame and these were positive. Four were unthrifty but not lame ; two of these were positive and two negative. The authors conclude that the results demonstrate the value of the plate test as a group diagnostic agent in the detection of swine erysipelas.—R. GWATKIN.

GRASSET, E. (1942). **Plague Immunization with Live Vaccine in South Africa.**—*Trans. R. Soc. trop. Med. Hyg.* **35.** 203–211.

The vaccinal emulsion consisted of a mixture of the Tjiwidej (Java) strain [OTTEN (1926)] and the E.V. (Madagascar) strain [GIRARD & ROBIC (1936)], strains which had spontaneously become completely avirulent after some years in the laboratory, grown for 24 hours on agar at 37°C. and standardized to contain 1,000 million organisms per ml. It was kept in the ice chest at 2°–4°C. and used from the 5th–15th day. The dose used was 1·0 ml.

From the practical and administrative point of view, immunization with live human plague vaccine has the advantage of requiring only a single injection, whereas two injections of killed vaccine are necessary. —M. H. KYAW.

BYRNE, J. L. (1941). **Salmonellas and Micro-organisms Apt to be Confused with Them. Observations on their Incidence in the Intestinal Tract of Normal Foxes.**—*Canad. J. comp. Med.* **5.** 157–163.

B. examined the intestinal tracts of 74 normal foxes for the presence of salmonella ; from 26 of the foxes he obtained organisms which, on primary tests, seemed to belong to this genus. Further differential tests showed that of the 26 cultures five were late lactose-fermenting variants of *Bacterium coli*, 18 were members of the genus *Proteus*, and three were salmonella. B. suggests that the *Bact. coli* variants are of no particular importance except that they may be mistaken for salmonella if not incubated for a sufficient length of time. The high incidence (22%) of the *Proteus* organism in normal foxes, the nature of the animals' food, and the fact that investigators of this organism in other species are reluctant to consider it a true pathogen suggest that it is not pathogenic in the fox. As salmonella organisms can be found in the normal fox intestine in a few instances, their occasional isolation from individual foxes, particularly when no intestinal lesions are present, is of no aetiological significance. Recovery, however, from a large number of foxes on the same or neighbouring ranches or from animals with definite lesions may well indicate pathogenicity.

HOPFENGÄRTNER, M. (1939). Salmonella schleissheim, ein neuer vom Rind stammender Paratyphustyp. [*S. schleissheim*, **a New Salmonella from Cattle**].—*Berl. Münch. tierärztl. Wschr.* Aug. 11th. 501–506.

In 1927 H. isolated a salmonella from two cows in Aidenbach, Bavaria, which was submitted to several laboratories where it was considered to be a " paratyphoid B Schottmüller strain ". It appeared at that time to be identical with the paratyphoid B strain except that it liquefied gelatin. In 1938, KAUFFMANN & TESDALL found that the organism was a hitherto unknown type of salmonella which they called *S. schleissheim.* When studied by these workers the strain had been kept in the laboratory for ten years, its pathogenicity was very low, and certain biochemical and growth characters were different from those found by H. when the organism was examined immediately after being isolated from the cattle. When examined in 1937, the strain still retained its ability to liquefy gelatin ; rhamnose was fermented and this served to distinguish the organism from *S. abortus-bovis* which itself liquefies gelatin. The antigenic formula of *S. schleissheim* is

given by H. as IV . . . b—z5. [In the report of the Third International Congress for Microbiology (New York, 1939), the Salmonella Subcommittee of the Nomenclature Committee give the antigenic formula as IV, XXVII : b, z_{12} : —.] This article is published in order to report the characters of the organism as originally isolated and to compare them with those described by KAUFFMANN & TESDALL when they first identified it as a new type ten years later.—E. G. WHITE.

WESSELINOFF, W. (1942). Ein Fall von Salmonella anatum beim Pferd. [*S. anatum* **Infection in a Horse**].—*Tierärztl. Rdsch.* **48.** 95–97.

A foal with colic was slaughtered. On examination no pathological changes were noted, but cultures from the kidney and liver showed, in addition to numerous *coli*-like organisms, some colonies of a rapidly growing organism which was found to have the antigenic constitution corresponding to *S. anatum*.—J. G. CARR.

POLLARD, M. (1939). **Serological Relationship between Salmonella pullorum and the Lactobacilli sp.—Preliminary Report.**—*Proc. Va Acad. Sci.* p. 63. [Abst. in *Exp. Sta. Rec.* **82.** 827, copied *verbatim*].

It was found that lactose broth suspensions of *Lactobacillus casei* injected parenterally into negative turkeys and chickens induced a positive agglutination reaction with *S. pullorum* antigen up to a titer of 1/200. Note is made of the necessity of adjusting the pH of the antigen to that of normal fowl blood.

BOIVIN, A. (1941). Sur le passage de la variante lisse à la variante rugueuse chez les bactéries à " Gram négatif " et plus spécialement chez les *Salmonella*. [**The Change of Salmonella Variants from Smooth to Rough**].—*C. R. Soc. Biol. Paris.* **135.** 487–491.

Following a summary of the variation in the behaviour of individual strains of *coli*-typhoid bacilli with regard to rapidity of S to R variation by subculture on agar plates at intervals of several weeks, the difference is described in the antigenic stability of two smooth *S. enteritidis* strains of equal virulence for mice. Subculture of 17 S strains of *S. paratyphi B* in broth at weekly intervals through six passages showed that eight strains yielded R variants on agar plates while nine remained wholly S. After subculture of these nine strains in the same manner in broth containing 5% specific O antiserum, four strains remained wholly S, four yielded R variants and one gave rise to only R colonies. Similarly, *Salmonella typhi* strains possessing both O and V antigens were shown to vary greatly in their susceptibility to antigenic modification by subculture in the presence of O or V antiserum.—R. O. M.

BLAZHEVICH, I. V. (1938). Brutsellez loshadeĭ, ego diagnostika i profilaktika. [**Diagnosis and Prevention of Equine Brucellosis**].—*Trud. vet. Fak. Vologda. sel'skokhoz. Inst.* **2.** 3–13.

In the course of a year, B. made clinical and serological examinations of 930 horses for brucellosis. 104 (19·8%) of 524 horses from infected farms, 25 (17%) of 164 brought for clinical treatment and two out of 250 horses from uninfected farms yielded positive reactions. Of these 131 reactors, 55 had fistulous withers, 29 poll evil, 5 both withers and poll affections, 5 arthritis, and the remainder did not show any clinical symptoms. The titres ranged from 1 : 50 to 1 : 3,200, only eight showing titres over 1 : 400. B. considers that a reaction at 1 : 50 is doubtful. He isolated the organism in pure culture from unopened lesions of 12 horses. He emphasizes the danger of infection of horses from affected cattle.—A. MOLDAWSKY.

TRAUTWEIN, K. (1941). Zur Verbreitung der Bang-infektion in den Rinderbeständen Badens und des Elsass. [**Incidence of Bovine Brucellosis in Herds of Baden and Alsace**].—*Dtsch. tierärztl. Wschr.* **49.** 424–427.

A large-scale diagnostic survey was made in 32 *Gemeinden* in three separate areas of Baden, in most cases using the agglutination, complement-fixation, and Meinicke's and Sachweh's flocculation tests together. Of 13,523 cattle over one year of age only 250 (1·8%) reacted. The great majority of herds (71%) were peasants' herds of 1–5 beasts, 27% were small herds of 6–19 animals, and none of the remaining herds had over 50 cattle. This tendency to small herds limits the spread of brucellosis. 97% of the peasants' herds were clean, also at least 92% of the other classes of herd. These figures compare favourably with herds from other parts of Germany.

Preliminary tests in Alsace, made on 20,000 cattle imported from Denmark, Switzerland, Austria, and Germany, showed an infection percentage of 5·2%. —J. E.

FRITZSCHE, K. (1941). Praktische Erfahrungen bei der Bekämpfung des seuchenhaften Verkalbens. [**Experience in the Control of Bovine Contagious Abortion**].—*Tierärztl. Rdsch.* **47.** 369–371.

A discussion on control principles, based on the idea that these measures (elimination of carriers, etc.) should be undertaken during the latent phase period of natural infection in a herd, *i.e.* 1–2 years after a " flare-up " of abortions and at a time when the animals are immune and before new breeding heifers are added to the herd.—J. E.

*HOLTH, H. (1941). Oversikt over de diagnostiske undersøkelser i anledning den smittsomme kastning foretatt ved Veterinaerinstitutet i 1938, 1939 og 1940. [**Review of Diagnostic Work in Bovine Brucellosis at the Veterinary Institute, Oslo, in 1938 - 40**]. —*Norsk VetTidsskr.* p. 133. [Abst. from abst. in *Skand. VetTidskr.* **31.** 309].

In 1938, 24,325 blood samples were examined, 3,203 being from aborting cows. In 1939 the figures were 17,274 and 3,012 respectively, and in 1940, 10,706 and 2,413. Of the aborting cows tested in 1938, 3·97% reacted, 4·32% reacted in 1939, and 2·4% in 1940.

BOĬCHENKOVA, N. G. (1938). K voprosu ob izmeneniyakh krovi pri brutselleze u krupnogo rogatogo skota. [**Blood Changes in Bovine Brucellosis**].—*Trud. vet. Fak. Vologda. sel'skokhoz. Inst.* **2.** 165–170.

Observations were made on one infected and one uninfected farm. In infected cows the examination of blood was made 1–5 months after abortion and there was 41·4% increase of erythrocyte sedimentation rate and a relative hypocalcaemia (decrease of 17·8%) in comparison with uninfected cows. In some animals considerable eosinophilia (up to 35%) was observed. —A. MOLDAWSKY.

FERGUSON, L. C., IRWIN, M. R., & BEACH, B. A. (1941). **The Effect of Parturition on the Blood Picture of Cows in Health and During Infection with** *Brucella abortus*.—*Amer. J. vet. Res.* **2.** 394–399.

Erythrocyte and leucocyte counts were made on the blood of normal cows and of those infected with *Br. abortus*, during the period from 34 days before parturition to 34 days after. It was found that the general trend of the counts was similar in normal and infected animals. The erythrocyte count increased slightly during the first ten days after calving, and then decreased to less than the preparturient level. The total leucocyte count decreased after parturition and returned later to the normal level. This was thought to be due to the leucocytic requirements of the uterus and

mammary gland causing a reduction in white blood corpuscles in the peripheral blood. The neutrophile and lymphocyte percentages remained constant during the whole period, while the monocyte count increased, and the eosinophile count decreased in the ten days after parturition. The normal fluctuations in the differential leucocyte count were found to be slightly exaggerated during the period under observation.—I. W. BURTON.

ITHURRAT, E. M. F. (1941). Mis investigaciones sobre las brucellas. **[Research on Brucella Strains from the Argentine]**.—*Rev. Med. vet., B. Aires.* **23.** 366–377.

Over a period of 11 years the author studied 647 strains of brucella in the Argentine. Of these, he classified 348 as *Br. melitensis*, 105 as *Br. abortus*, 192 as *Br. suis*, and 2 as atypical. The majority of the strains was isolated from material of human origin.

In the cultures it was found that R variants were much more common in liquid medium. All three types were equally susceptible to dissociation when cultivated in liquid medium. Since the same strain produces S colonies on solid medium and R cultures in liquid medium it is concluded that there is no reason to believe that R strains exist in the human or animal system.

The author found that antigen for the agglutination test was more reliable when prepared from all three types of brucella than when prepared from *Br. abortus* alone.—MILLER WATSON.

FITTE, O. A. (1941). La brucelosis caprina en los llanos de la Rioja. **[Brucellosis in Goats in the Argentine]**.—*Rev. Med. vet., B. Aires.* **23.** 503–536.

F. states that brucellosis of goats on the plains of the Rioja has been in existence for 400 years. During this time a state of premunition has been developing in the goats.

Premunition may break down under certain circumstances, such as drought or bad hygienic conditions, and then abortion may occur ; infected goats, however, may not abort. In herds with a well established premunition agglutinins are not found in the blood, but whenever the state of tolerance breaks down agglutination at quite high titres occurs. Animals introduced from other areas, and with no tolerance, abort and show high aggln. titres. The danger is discussed of human beings' contracting undulant fever from infected goats.—M. W.

ORLOV, E. S., & KARNEEVA, V. E. (1939). Opyt ozdorovleniya brutselleznogo ovtsesovkhoza. **[Eradication of Brucellosis from Sheep Farms]**.—*Sovyet. Vet.* No. 5. pp. 19–23.

Brucellysate [*V. B.* **9.** 97.] is the best form of abortin. By segregation of young animals (lambs and first lambing ewes) that were negative reactors to the test, brucellosis was eradicated from 13 flocks within two years. The disease could not be eradicated by the segregation of older sheep, which passed the test mainly because, in the authors' opinion, 7–9% of chronic infected (carrier) sheep do not react either to serological or allergic tests. On a heavily infected sheep farm the authors isolated *Br. melitensis* from cattle.

—A. MOLDAWSKY.

RUHLAND, H. H., & HUDDLESON, I. F. (1941). **The Rôle of One Species of Cockroach and Several Species of Flies in the Dissemination of** *Brucella*.—*Amer. J. vet. Res.* **2.** 371–372.

By feeding one species of cockroach and several species of flies on pure culture of *Br. abortus*, and subsequently re-isolating the bacillus from the intestinal contents, the authors were able to show that the organisms remained alive in the cockroach for less than 24 hours and that they survived in flies for at least 96 hours. Houseflies, stableflies, and blowflies must therefore be considered as possible means of transmission of brucellosis.—ISOBEL W. BURTON.

QUEVEDO, J. M. (1941). Acerca de la filtrabilidad de la brucella. Repetición de un ensayo de Sarnowieck. **[The Problem of Filtrability of Brucella : Repetition of Sarnowiec's Experiment]**.—*Rev. Med. vet., B. Aires.* **23.** 287–297.

Q. repeated SARNOWIEC's work [*V. B.* **9.** 458.] with filtrates of brucella cultures but was unable to infect g. pigs with them. Unfiltered cultures of the same strains did infect g. pigs. The experiments were controlled by the agglutination and intradermal allergic tests and the ophthalmo-reaction.—MILLER WATSON.

I. BARRON, N. S. (1942). **Entero-toxaemia in Goats.**—*Vet. Rec.* **54.** 82.

II. CROWHURST, F. A. (1942). **Entero-toxaemia in Goats.**—*Ibid.* 115.

III. SPRATLING, F. R. (1942). **Entero-toxaemia in Goats. [Correspondence]**.—*Ibid.* 153.

I. Animals in prime condition appeared to be most susceptible. Early symptoms were dullness, loss of appetite, uneasiness, and exaggerated breathing. Death was immediately preceded by marked excitement. P.M. examination revealed inflammation of the fourth stomach, bowels, and caecum ; in the last it was most severe and localized in patches. Small haemorrhages were present in pericardial fat and adjacent tissues of the heart. The kidneys were mottled and in one case were soft and almost pulpy. No pathogens were isolated from the tissues, but a very potent toxin was demonstrated in the filtrate of the contents of the small intestine. From the results of serum immunization tests carried out on mice, the toxin was considered to be that of *Clostridium welchii*, Type C. All goats likely to become affected were immediately given magnesium sulphate and their rations, other than hay, were halved for several days and each was inoculated subcutaneously with 20 ml. of lamb dysentery serum. No further case occurred for over a year. B. believes that a number of outbreaks of disease amongst goats in Great Britain, the cause of which was obscure, were the result of *Cl. welchii* infection.

II. The disease appeared suddenly in milking goats in prime condition and death followed usually within 24 hours. The animals became very violent before lapsing into complete unconsciousness. P.M. examination revealed slight inflammation of the abomasum and the first part of the small intestine with small haemorrhages in the heart muscle. No macroscopic lesions could be seen on the kidneys. The cases were believed to be tetany and calcium and magnesium therapy was applied without success. Lamb dysentery serum followed by vaccine as a preventive, and serum alone as a curative measure also failed to reduce losses. 4 ml. of pulpy kidney disease serum given subcutaneously and repeated in a month gave somewhat better results. In other sporadic cases, repeated intravenous injection of 1 oz. of glucose in normal saline resulted in recovery in some cases.

III. A female goat had diarrhoea, a temperature of 106°F., and showed lassitude ; breathing was accelerated. 50 ml. of lamb dysentery serum were given subcutaneously and 10 g. of M & B 693 orally. Kaolin poultices were applied to the chest wall and repeated every 12 hours. By the next morning the animal's condition had improved. 5 g. of M & B 693 were then given early in the morning, followed by 2 g. every eight hours. Altogether, the total dose given was 27 g. ; the animal recovered.—M. H. KYAW.

FREI, W. (1942). Biochemisches und Pathologisch-physiologisches über Rauschbrand-Pararauschbrand-Impfungen. [**Biochemical and Pathological-Physiological Considerations on Immunization against Blackleg and Malignant Oedema**].—*Schweiz. Arch. Tierheilk.* **84.** 45–53.

An account of the conditions governing the cultivation of anaerobes, choice of method for preparing vaccines, and the influence of the autonomic nervous system on infection in these conditions.—J. G. CARR.

REED, G. B., ORR, J. H., & SMITH, D. (1941). **Fibrinolytic Action of Gas Gangrene Anaerobes.**—*Proc. Soc. exp. Biol., N.Y.* **47.** 228–231.

Fibrinolytic tests on plasma from man, rabbits, g. pigs, and sheep showed that *Clostridium welchii, Cl. novyi, Cl. septicum,* and *Cl. sordellii* produce an active fibrinolytic substance; g. pig and rabbit plasma clots were more readily broken down than human plasma while sheep plasma was not attacked by any strains of *Cl. welchii* tested. Both sheep and rabbit plasma resisted *Cl. sordellii.* Certain other saccharolytic species, *Cl. fallax, Cl. tertium,* and *Cl. aerofoetidum* were completely inactive in the plasma of all four species, but three proteolytc species, *Cl. histolyticum, Cl. sporogenes,* and *Cl. tyrosinogenes* produced a very rapid breakdown of all the types of plasma tested. A few strains in both saccharolytic and proteolytic groups of gas gangrene anaerobes produced anticoagulation factors which prevented $CaCl_2$ coagulation of plasma; this was not a pH effect.—E. COTCHIN.

ILLÉNYI, A., & KENESSEY, S. (1940). Die Wirkung des durch die Bakterien produzierten C-Vitamins auf die Entwicklung der Tetanusbazillen. [**The Action of Vitamin C of Bacterial Origin on the Development of Tetanus Bacilli**].—*Zbl. Bakt. I.* (*Orig.*). **146.** 204–207.

The ability was determined of tetanus bacilli to grow in mixed culture with various aerobes under aerobic conditions. Suggesting that this may be due to the production of vitamin C, which also has this action, the authors determined the amount of ascorbic acid in filtrates of broth and xylose-broth in which various bacteria and moulds had been grown, and also the amount of the filtrate needed to be added to broth to produce aerobic growth of tetanus. Most filtrates induced growth, but the amount of vitamin C required was not constant, indicating that other substances also play some part in the process. [Many of the values for vitamin C in the filtrate added cannot have been calculated, as is stated, from the values reported, unless a very large number of arithmetical errors was made.]
—J. G. CARR.

GRAY, D. F., & HOEBEN, J. G. H. (1941). **Infections of the Mycetoma Type in Dogs.**—*Aust. vet. J.* **17.** 93–101.

The authors discuss chronic local mycotic infections (mycetomas) in man and animals and describe four cases in racing greyhounds, originating from bite wounds. Tortuous sinuses formed, localized multiple abscesses developed, and extensive growth of fibrous tissue occurred around the lesions. A thin watery pus was discharged containing a few white granules 0·5–1·0 mm. in diameter. The disease lasted for months and the long-standing cases did not respond to ordinary surgical treatment. Early cases responded to surgery and intravenous administration of sodium iodide. From three cases, the authors isolated an aerobic *Actinomyces* closely resembling *A. muris* but differing from it in failing to ferment sugars. It is described in full and the name *A. canis* is tentatively suggested.

Laboratory stocks of mice and rats died out in an epidemic of broncho-pneumonia. An organism was isolated which corresponded culturally and biochemically to *A. muris.* Intranasal inoculation of cultures in mice reproduced the disease.—W. I. B. BEVERIDGE.

DERBEDENEV, I. P., TSELISHCHEVA, L. M., & OMAROV, K. S. (1939). K immunologii peripnevmoniinykh privivok krupnogo rogatogo skota. [**Immunity in Calves Born of Cows Inoculated against Contagious Bovine Pleuro-Pneumonia**].—*Sovyet. Vet.* No. 1. pp. 31–32.

Calves born of cows which have been inoculated 1½–5 months previously with attenuated or virulent virus acquire an immunity lasting 4–5 months. Calves from cows inoculated only 25–26 days previously have no immunity. The authors state that preventive inoculation need not be carried out in calves from cows which have been immunized 1½ months before parturition.—A. MOLDAWSKY.

SCHERMER, S. (1941). Untersuchungen über die bei Pferden vorkommenden Flechten. [**Ringworm in Horses**].—*Berl. Münch. tierärztl. Wschr.* July 4th. 321–324.

Many horses returning from the Sudeten campaign were infected with ringworm, and those from France to an even greater extent. Infected hairs were cultured on honey agar and on wort agar: growth of mycelium from hairs could usually be seen shortly after a week and macro- and microsporidia after two months at room temperature. Six strains of *Microsporon equinum* were identified and found capable of infecting horses and g. pigs; cultures showing no spores were also infective. One strain of *Achorion gypseum* and one of *Trichophyton equinum* were isolated, the latter being particularly infective for human beings. The clinical pictures caused by these species are described, but it is emphasized that although the clinical picture and microscopic examination permit diagnosis and differentiation the latter can only be confirmed on cultural grounds. The cultural characteristics of the three species mentioned are described. Only *M. equinum* was found causing widespread infection.—D. L. R.

DISEASES CAUSED BY PROTOZOAN PARASITES

YUTUC, L. M. (1941). **A Note on the Incubation and Prepatent Periods of Equine Artificial Surra.**—*Philipp. J. Anim. Indust.* **8.** 341–344.

Further study of the incubation and prepatent periods of surra infection was necessary. The results reported in this paper refer to artificial surra in 36 mature horses. One strain of trypanosome was used, but the dose of infection was not noted. Rise in temperature, which is the first noticeable clinical evidence of surra, was used as the criterion of the incubation period, and the prepatent period was determined by daily examinations of fresh blood from the ear vein from the time of infection to the first appearance of trypanosomes in the blood. The length of the incubation period, 5–12 days, approximated very closely to that of the prepatent period, which was on the average 0·86 day shorter. There was evidence of a close reciprocal relation between the two periods.—C. HORTON SMITH.

PEREIRA, C., & DE ALMEIDA, W. F. (1940). Sôbre a verdadeira natureza das "formas ameboides", dos pretensos "cistos" e "formas degenerativas" no

gênero "Trichomonas Donné, 1836". **[Nature of Amoeboid Forms and So-Called Cysts and Degenerative Forms of** *Trichomonas***].**—*Arq. Inst. biol., S. Paulo.* **11.** 347–366. [English summary].

The authors studied cultures of *T. vitali*, *T. muris*, and *T. caviae* in the medium suggested by SIMITCH. In rapidly growing cultures they found the following types:–non-flagellate, non-motile forms; amoeboid forms with enclosed flagella, motile or non-motile with flagella in different stages of development and pseudopodia of various types; amoeboid forms without free flagella but with undulating membranes and axostyle, and various types of true flagellate forms, with or without axostyle.

As this variety of types was noted particularly in rapidly growing cultures, the authors suggest that the amoeboid and other forms are not degenerative as is frequently considered. They point out that the amoeboid forms predominate in lesions in the throats of young pigeons.

They believe that much confusion has arisen from the use of unsuitable stains, particularly of the iron-haematoxylin type. They obtained much better results from stains of the Romanowsky type. They also consider that the study of fixed and stained smears direct from the host leads to misinterpretation and that more use should be made of cultures.—MILLER WATSON.

TORRES, C. M. (1941). Sobre as alterações da pele do cão no kala azar sul-americano. **[Changes in the Skin of the Dog in South American Kala Azar].**—*Rev. brasil. Biol.* **1.** 81–82.

T. studied microscopically 88 skin biopsies from five dogs infected with human and canine strains of the leishmania causing South American kala azar.

The lesions consist of histiocyte infiltration of the pars papillaris and of the more superficial part of the corium. In advanced cases the parasites are abundant in the cytoplasm of these histiocytes. In some cases the histiocytes form nodules or granulomas around the blood vessels, particularly around the vessels of the papillae and of the sweat glands and also around the vessels in the subcutaneous tissue.

The lesions have a tendency to retrogression, the histiocytes being gradually transformed into fixed tissue cells. The lesions are not of uniform size and do not occur simultaneously, all stages being found in the same patient at the same time.

Experimentally infected dogs are affected by vesico-pustular dermatitis and purulent folliculitis which are not, apparently, caused by the leishmania. Perivascular exudate may contain many organisms and this lymph is probably the means by which infection is carried by the intermediate host.

Swelling of the feet, such as has been reported in artificially infected hamsters, was noted in one dog. The oedema is caused by vascular exudation and the exudate contains many histiocytes and plasma and mast cells. Leishmania are usually absent.—M. WATSON.

KOCHETKOV, A. V. (1938). Koktsidii ovets. **[Coccidia of Sheep].**—*Trud. vet. Fak. Vologda. Sel'skokhoz. Inst.* **2.** 209–214.

The following coccidia found in sheep in North Russia are in the order of their frequency:–*Eimeria arloingi*, *E. nina-kohl-yakimovi*, *E. faurei*, *E. galouzoi*, *E. parva*, and *E. intricata*. Lambs up to one year old have been found to be most affected.—A. MOLDAWSKY.

YAKIMOFF, V. L. (1940). Coccidios das aves na União Sovietica. **[Avian Coccidia in Russia].**—*Arq. Inst. biol., S. Paulo.* **11.** 607–620. [English summary].

Y. lists the avian coccidia found in Russia. These include *Eimeria tenella*, *E. acervulina*, *E. maxima*, and *E. mitis* in fowls; *E. truncata*, *E. anseris*, *E. nocens*, and *E. parvula* in geese. *E. meleagridis* has been found in turkeys. Pigeons are parasitized by *E. labbeana*. Details are also given of coccidia of game and of wild birds.—MILLER WATSON.

RUBINO, M. C. (1941). Garrapata—tristeza—premunición. **[Tristeza (Piroplasmosis and Anaplasmosis): Tick Transmission and Premunition].**—*Bol. mens. Direcc. Ganad., Montevideo.* **25.** 219–240.

The organisms concerned in Uruguay are *Babesia bigemina*, *B. argentina*, and *Anaplasma marginale*. All three are transmitted by *Boophilus microplus*; *A. marginale* may be transmitted during operations such as de-horning. Premunity is established by a natural attack or by the injection of virulent blood. In the case of anaplasmosis, the period of premunition lasts for a considerable time, but with babesia infections premunition tends to disappear. R. states that the premunition brought about by a mild attack following slight tick infestation may be broken down by a heavy tick infestation. It is necessary, therefore, to maintain the degree of premunition by periodic inoculation with virulent blood.—MILLER WATSON.

COGGESHALL, L. T. (1941). **Infection of Anopheles quadrimaculatus with Plasmodium cynomolgi, a Monkey Malaria Parasite, and with Plasmodium lophurae, an Avian Malaria Parasite.**—*Amer. J. trop. Med.* **21.** 525–530.

During a search for mosquitoes which could transmit experimental monkey malaria, it was discovered that *A. quadrimaculatus*, the principal vector of the human disease in the U.S.A., is extremely susceptible to *P. cynomolgi* and partially susceptible to *P. lophurae*, both of which species originated in the orient. These experiments furnished no evidence of the mechanisms responsible for the susceptibility of various mosquitoes to different malarial infections, but they emphasize the broad relationship existing between host and parasites. One species of mosquito is seen to be capable of infection by three species of plasmodia originating from three different hosts. Natural association of the insect vector and parasite does not seem to be necessary for susceptibility, as monkey plasmodia from Java and an avian form from Borneo can both be transmitted by *A. quadrimaculatus* which is confined to the U.S.A. C. concludes that, in general, anophelines have a greater capacity for infection with a diversity of plasmodia than have culicines which only transmit avian malaria.—C. H. S.

DOBLER, M. (1941). **Exoerythrocytic Schizogony Associated with the Matinal Strain of** *P. relictum* **after Passage through Ducks.**—*Amer. J. Hyg.* Sect. C. **34.** 49–53.

Exo-erythrocytic schizogony occurred in the matutinal strain of *P. relictum*, but not in the Mexican strain of *P. relictum* nor the Hartman-Hewitt strain of *P. cathemerium*, after passage through ducks. No explanation, however, has been found to account for the sudden appearance of exo-erythrocytic bodies after such passage. No exo-erythrocytic bodies were observed in the canaries of the first transfer in two experiments. One canary died on the tenth day, which suggests that exo-erythrocytic schizogony had occurred, but no autopsy was made. Two canaries which had been inoculated with blood from the same duck showed exo-erythrocytic bodies in the second transfer from these birds. Birds infected with the exo-erythrocytic strain succumbed on or about the tenth day following inoculation, when the peripheral blood showed very few parasites.—C. HORTON SMITH.

HUFF, C. G. (1940). **Quantitative Studies on Size, Viability and Growth Rates of Oocysts of Different**

Strains of Avian Malaria.—*Amer. J. Hyg.* Sect. C. **32.** 71–80.

Strains of parasites of similar morphology but different in their physiology and immunology are now known in avian, simian, and human malarias. H. now adds biometric studies with a view to demonstrating genetical constitutions during asexual and sexual reproduction in the mosquito. Within one species, *P. cathemerium*, differences exist between strains in the matter of infectiveness for *Culex pipiens* and in the maximum size of oocysts under conditions of similar temperature and humidity. Slight differences also exist in the time of day of their maximum period of segmentation. Two hypotheses are put forward to account for such differences :– (1) that rates of growth of oocysts may differ in certain individuals because of as yet unknown environmental differences, or (2) because of inherent differences in the suitability of individual mosquitoes as hosts.—C. HORTON SMITH.

HEGNER, R., & WEST, E. (1941). **Modifications of *Plasmodium cathemerium* when Transferred from Canaries into Ducks.**—*Amer. J. Hyg.* Sect. C. **34.** 27–39.

The authors believe that the study of the changes which occur when a single species of avian plasmodium is cultivated in different species of hosts is a sound approach to the problems associated with host-parasite specificity. It was found that the prepatent period of one strain of *P. cathemerium* ranged from 3–5 days in canaries and from 3–8 days in ducks, the length of the period depending on the age of the bird and the number of parasites inoculated. Other variations observed were concerned with total parasite number, synchronicity, segmentation, etc.—C. HORTON SMITH.

COULSTON, F., & MANWELL, R. D. (1941). **Single-Parasite Infections and Exoerythrocytic Schizogony in *Plasmodium circumflexum*.**—*Amer. J. Hyg.* Sect. C. **34.** 119–125.

Single parasites and small numbers of parasites were obtained by micro-manipulation and serial dilution from the erythrocytic cycle of two strains of *P. circumflexum*. These, when injected into a number of female canaries, produced infections in which no exo-erythrocytic schizogony was observed, but after a number of passages it reappeared and was found in almost every case. The authors consider this to show that erythrocytic forms give rise to the unpigmented free stages, that the two stages are to be regarded as parts of the same cycle, and also that the exo-erythrocytic schizogony only occurs as an abnormality when the host's defence mechanisms are weakened. There is also a suggestion in this of a close relationship between malarial plasmodia and forms like *Haemoproteus*. Sporozoites evidently do not invade the erythrocytes at once but pass through "exo-erythrocytic" and pigment-free developmental stages in other types of cells. At a later stage of this cycle the forms resemble those seen in infections derived from erythrocytic forms, and the evidence produced in this paper points to the reversible nature of the cycle under suitable conditions.—C. H. S.

BELTRAN, E., & LARENAS, R. (1940). El ciclo esquizogónico en *Plasmodium gallinaceum* Brumpt. [**Schizogony Cycle in *P. gallinaceum***].—*Rev. Inst. salubr. Enferm. Trop.* **1.** 291–309.

Using a strain of *Plasmodium* supplied by BRUMPT, the authors studied the schizogony cycle in six artificially infected cocks. Blood films were made every six hours. The time observed for the complete schizogony cycle was 36–42 hours and since the periodicity of the disease was very similar, synchronicity was found to be very high.

Parasite mortality, although high, was not as high as that reported in other avian plasmodia.—M. W.

—. (1941). **Geographical Distribution of Leptospirosis in the United States.**—*N. Amer. Vet.* **22.** 720.

In a study of leptospirosis in dogs in Pennsylvania, 38% of 105 serum samples in a rural community and 28% of 50 serum samples in an urban district gave positive agglutination reactions with either *L. canicola* or *L. icterohaemorrhagiae* antigens. The possibility of human infection from canine carriers of leptospira is discussed. One such case in a three-year-old child is cited.—D. D. OGILVIE.

ROSENFELD, W. D., & GREENE, M. R. (1941). **Studies on the Metabolism of Leptospira.**—*J. Bact.* **42.** 165–172.

Some animal fluid appears to be essential for the growth of leptospira, and previous experiments with a serum preparation precipitated with alcohol had indicated that the growth factor was not a protein. Attempts are now recorded to influence the survival of leptospira in Schüffner's medium (peptone + Ringer's solution) by the addition of thiamin hydrochloride, riboflavin, nicotinic acid, pyridoxin hydrochloride, ascorbic acid, catalase, and milk peroxidase. No substance tested was capable of maintaining leptospiral growth in the absence of serum. Nicotinic acid, thiamin hydrochloride, and riboflavin gave noticeable stimulation of growth at certain concentrations but proved inhibitory in higher concentrations. The action of these substances is discussed.—U. F. RICHARDSON.

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

*SCHMIDT, S. (1941). Om Fremstilling af Vaccine mod Mund- og Klovesyge. [**Technique of Preparation of Foot and Mouth Disease Vaccine**].—*Maanedskr. Dyrlaeg.* **52.** 601–623. [Abst. from abst. in *Skand. VetTidskr.* **31.** 227].

S. describes the organization and methods of a laboratory producing foot and mouth disease vaccine. Workers on entry discard all garments, pass through the washing and bath rooms, and assume laboratory clothing. On departure the clothing is removed for steam sterilization and each person takes a bath, washes and dries the hair and dresses in outdoor clothes. Complete rubber attire is worn in the animal houses. Infective material is cremated within the laboratory; fluid effluent is boiled before release. The disease used to spread from the vaccine room to the experimental animals until special sterilizers were incorporated in the laboratory ventilation systems. For the preparation of vaccine, cattle are inoculated into the epithelium of the tongue, are killed 24 hours later, the tongue is excised and the lymph and walls of vesicles are removed. The epithelium of the walls of the vesicles is minced, mixed with 6–7 parts of distilled water and subjected to a pressure of 200 atm. to induce cell disintegration. After filtration (Seitz E.K.) the virus material is adjusted with glycine-salt solution to a pH of 8·5. After removal of the heads the bovine carcasses are converted into meat- and bone-meal. A batch of vaccine is prepared from 22–184 cattle, each yielding an average of 44 g. of virus material. The latter, after treatment as above, is mixed with aluminium hydroxide and formalin, heated to 25°C., and is innocuous about four weeks later. A test injection is then made on at least three cattle, a quadrupled dose being used. If the test is satisfactory, virus

of high potency is injected to test the immunity. The vaccine, of which 1,000–3,000 litres can be produced weekly, retains its properties for 12 months.—G. B. B.

*VIANELLO, G. (1941). **[Immunization against Foot and Mouth Disease by Anisol Vaccine].**—*Clin. vet., Milano.* **64.** 165–182. [Abst. from abst. in *Wien. tierärztl. Mschr.* **28.** 554].

The Vianello vaccine, which it is proposed should be generally known as *vaccino antiaftoso italiano* is prepared as follows :—membranes from cattle lesions are rubbed down, extracted with distilled water at pH 7·6, and centrifuged. A 5·5% suspension is added to an equal quantity (20 litres each) of glycocoll buffer solution at pH 8–8·2 and 60 litres of $Al(OH)_3$ are added. Anisol is then added at a concentration of 3 : 1,000. The mixture is shaken for half-an-hour, kept for four days in an incubator at 33·5°C., cooled at room temperature, and then kept in cold storage at 3–5°C. The vaccine keeps for six months in this condition.

Before field use each batch of vaccine is tested on 15–20 g. pigs and on 100 cattle. Half a million cattle have been immunized. It is claimed that a strong immunity is conferred and that it becomes effective in 5–6 days, being fully effective in 12–14 days ; the duration of immunity is about four months. It is claimed that the Italian vaccine is more efficacious than the Riems vaccine and that it is superior to it in keeping quality.—J. E.

*QUIROGA, S. S., & SCHANG, P. J. (1939). Observaciones experimentales sobre la conservación del virus aftoso. **[Experiments on the Conservation of Foot and Mouth Disease Virus].**—*J. Agron. vet., B. Aires.* pp. 185–188. [Abst. from abst. in *Gac. vet., B. Aires.* **2.** 86].

The authors tested various methods of conserving foot and mouth disease virus. The most satisfactory method was storage of the virus in equal parts of glycerin and distilled water at 2–3°C. Virulent lymph preserved in this manner was infective after 100–150 days and epithelial material kept in the same manner was virulent at periods up to 734 days.—MILLER WATSON.

MACKERRAS, I. M., MACKERRAS, M. J., & BURNET, F. M. (1940). **Experimental Studies of Ephemeral Fever in Australian Cattle.**—*Bull. Coun. sci. industr. Res. Aust.* No. 136. pp. 116.

Ephemeral fever was maintained in experimental cattle through a series of 81 serial transfers extending over 2½ years. Clinical observations are described in detail. Relapses occasionally occurred a few days after the initial fever had subsided. The virulence of the strain of virus decreased slightly and the average incubation period increased from 2½ to 4 days. Pathological changes were not marked but usually included dilatation of small blood vessels generally, swelling of lymph nodes, and inflammatory changes which are slight on serous surfaces but sometimes severe in joints. There was a mild transient anaemia and a neutrophile leucocytosis. Blood was infective from the beginning of the fever to the fourth day after its subsidence, and could infect in doses as small as 0·002 ml. There was no evidence that the virus persisted in the blood for longer periods. The virus was probably also present in the nasal discharges when these were purulent. It was not present in specially high concentrations in the spleen or lymph nodes. In the blood it was associated exclusively with the leucocyte-platelet fraction, and probably with the platelets. It was shown to pass through gradocol membranes of A.P.D. 0·7μ. Blood stored between −2°C. and +2°C. remained infective up to 48 days. Leucocyte-platelet fractions desiccated from the frozen state could remain infective for over 90 days. Attempts to pass the infection through merino sheep were unsuccessful.

The disease cannot be transmitted by contact and is only transmitted with certainty by intravenous inoculation. Subcutaneous and intradermal inoculations are unreliable. Unsuccessful attempts were made to transmit the infection by *Stomoxys calcitrans* and three species of mosquito, both by interrupted bites and cyclically. It is suggested that the disease is transmitted cyclically by Ceratopogonidae (biting midges).

The disease confers a solid and lasting immunity, only one doubtful second attack occurring in 132 tests made from three days to two years after the first. Cattle not previously exposed to the disease are occasionally refractory to infection. Complement fixation has been demonstrated using antigen prepared from leucocyte-platelet suspension. Ephemeral fever is closely related to, but distinct from, dengue fever in man.—W. I. B. B.

UHLENHUTH, P., MIESSNER, H., & GEIGER, W. (1940). Die Immunotherapie bei der Schweinepest. **[Immunotherapy of Swine Fever].**—*Z. ImmunForsch.* **99.** 53–66.

The authors review experiments carried out since 1926 on swine fever antiserum. It was effectively used for immunization in conjunction with virus on many series of pigs, which were thus successfully immunized against test infection to the extent of 85–91%.

It was confirmed that S.F. immune serum used alone protects for 14 days and is consequently indicated for use on pigs sent to markets and shows and for herds in the vicinity of infected herds. In herds already affected it is only useful if the separation of actually infected pigs and those still not infected is properly carried out.

Serum-virus inoculation may be applied to healthy pigs in infected herds and is preferable to serum alone. The excretion of virus by pigs so immunized is without practical importance in herds already infected.—J. E.

MONGIARDINO, R. A., & HETZE, A. G. (1941). Algunos ensayos realizados con la vacuna "cristal violeta" para la prevención de la peste porcina. **[Trials with Crystal-Violet Vaccine against Swine Fever].**—*Rev. Med. vet., B. Aires.* **23.** 426–434.

The authors report on the use of a crystal-violet S.F. vaccine prepared in the Argentine. Fifteen pigs were vaccinated ; 32 days later they were immune to infection by cohabitation and by inoculation with virulent material. Pregnant sows did not abort.—M. W.

PENHA, A. M. (1940). Vacinação na peste suina com polpa de baço tratado pelo cristal violeta. **[Immunization against Swine Fever by Crystal-Violet Spleen Vaccine].**—*Arq. Inst. biol., S. Paulo.* **11.** 339–346. [English summary].

Using a vaccine prepared from 100 ml. finely ground spleen pulp, 200 ml. 1% phenol solution, and 15 ml. 1% crystal violet solution, P. carried out 5,500 field inoculations. The dose was usually 10 ml. although in some cases 5 ml. proved sufficient. Immunity was conferred after 20 days but not within 15 days. The spleen is obtained from artificially infected pigs from which virulent blood is also obtained.—M. WATSON.

RASTEGAEVA, A. M., SIROTKIN, V. A., & ARTEMOVA, A. I. (1939). Iz opytov diagnostiki infektsionnoĭ anemii zarazheniem laboratornykh zhivotnykh. **[The Diagnosis of Equine Infectious Anaemia in Artificially Infected Laboratory Animals].**—*Sovyet. Vet.* No. 7. pp. 31–33.

Inoculation into the testicle, cerebrum, etc., of mice, g. pigs, and rabbits as well as the sensitization of these organs before inoculation, with virulent serum of

acutely affected horses did not produce a clinically recognizable syndrome. The usual haematological investigation of artificially infected animals also did not reveal a blood picture which could be of practical assistance in the diagnosis of the disease. When rabbits and mice are artificially infected, there is an increase in the number of reticulocytes in the peripheral blood. The injection of serum from healthy horses into infected animals does not bring about a reduction of the number of reticulocytes.—E. R. PARISER.

HAMMON, W. McD., & IZUMI, E. M. (1942). **A Virus Neutralization Test, Subject to Standardization: Used with Western Equine Encephalomyelitis, St. Louis Encephalitis and Mouse Adapted Poliomyelitis Viruses.**—*J. Immunol.* **43.** 149–157.

For carrying out surveys and determining the antibody content of large numbers of serum samples at different times, a standard antigen and method of testing are required. Suspensions, in sheep or rabbit serum-hormone-broth, of mouse brain infected with the above viruses were prepared, frozen, and stored at −76°C. The titre of the viruses remained constant for at least ten months. The 50% end-point of each virus was determined and also the multiple of this above which all mice were killed and below which all survived. This factor differed for each virus, but was found to be constant for all suspensions of the same virus. With Western equine virus it was 3·2, St. Louis virus 6, and the poliomyelitis virus 10. Thus with only one virus did a tenfold change in dilution alter the result from approximate 100% survival to approximate 100% death, and this was with a selected, highly susceptible, inbred strain of Swiss mice inoculated in a uniform manner. Using an appropriate dilution of Western equine virus, it can therefore be said that a given sample of serum contains sufficient antibody to neutralize ten times as much virus as just permits survival with a negative serum. If less uniformly susceptible mice or less well adapted viruses are used, the results are irregular.

—JOHN FRANCIS.

—. (1941). **Equine Encephalomyelitis and Human Encephalitis. Three Neurotropic Viruses Now Known to Affect Both Humans and Animals.**—*N. Amer. Vet.* **22.** 665–669.

The discovery of antibodies of St. Louis encephalitis virus in horses and the successful experimental inoculation of horses with this virus have shown that Eastern and Western E.E. viruses and St. Louis encephalitis virus can infect both man and horses. An account is given of the general position. Possible vectors, virus reservoirs, and vaccination procedures are discussed.—D. D. OGILVIE.

HAMMON, W. McD., REEVES, W. C., BROOKMAN, B., IZUMI, E. M., & GJULLIN, C. M. (1941). **Isolation of the Viruses of Western Equine and St. Louis Encephalitis from *Culex tarsalis* Mosquitoes.**—*Science.* **94.** 328–330.

From arthropod material collected in the Yakima Valley, Washington, during the summer of 1940, both Western equine encephalomyelitis and St. Louis encephalitis viruses were isolated. In each case the source was *C. tarsalis*, collected in July. Tests have demonstrated that Western E.E. virus can be isolated from *C. tarsalis* five days after it has fed on infected g. pigs. Further work is in progress.—D. D. OGILVIE.

HOWITT, B. F., & VAN HERICK, W. (1941). **Neutralizing Antibodies against St. Louis and Western Equine Encephalitic Viruses in Horses and Fowl.**—*Proc. Soc. exp. Biol., N.Y.* **48.** 247–250.

The results are given of neutralization tests on sera of domestic birds and horses collected from endemic and presumably non-endemic areas of California. Antibodies against the St. Louis virus were present in the blood of many horses and birds and, with few exceptions, were in association with the neutralizing substance against the Western equine virus. Of 43 unvaccinated normal horses and two recovered animals from endemic regions, all except two showed neutralizing antibodies against the Western equine virus and with the exception of ten the sera were positive to the St. Louis virus as well, but none was positive to the latter alone. Of the sera of 19 horses vaccinated against the equine strain, all were positive to the homologous virus but were negative to the St. Louis strain. Of 12 horses from areas where E.E. was rarely reported, four showed antibodies for the equine virus and two for the St. Louis. By far the greater proportion of sera positive for both viruses was obtained from known endemic regions. The same relationship in antibody formation was found for the sera of domestic birds as for horses. 46·8% of 96 fowl sera from known endemic regions were positive against the equine virus and 25·5% of 90 sera were positive against the St. Louis strain. All the birds were over one or two years of age and had lived through at least one summer when an inapparent infection might have occurred. Only 7% of 65 normal birds from non-endemic areas showed antibodies for the equine virus and none for the St. Louis. The largest number of sera positive to the equine virus came from fowls of varied breeds from areas where either human or equine cases had occurred. Sera from a small number of turkeys, ducks, pheasants, and peacocks also showed the same relationship in antibody formation.

It is suggested that a correlation exists between certain environments, where the clinical disease in man and horses is endemic, and the development of antibodies to both viruses in the blood of birds and horses, and that because of the presence of neutralizing substances for the St. Louis virus among relatively insusceptible animals, man may not be the only host for this disease.—R. ALLCROFT.

MITCHELL, C. A., & WALKER, R. V. L. (1941). **Studies in Equine Encephalomyelitis. Susceptibility of some Mammals and Birds.**—*Canad. J. comp. Med.* **5.** 314–319.

A strain of E.E. virus (Western type) produced infection in horses, g. pigs, mice, white rats, hamsters, and chipmunks. Cattle were only slightly susceptible. Swine, sheep, goats, foxes, cats, ferrets, and rabbits were refractory. The groundhog [a wild rodent] was susceptible when young. All young birds tested were found to be very susceptible, and older birds were resistant; the borderline was clearly marked between susceptible and resistant ages. Virus was found only in the brains of injected mammals, but in both blood and brains of birds which died from infection. The mammals, however, were mostly injected by the intracranial route and the birds subcutaneously.

Blood and brain from two geese which died following inoculation produced infection in a percentage of inoculated g. pigs. In a few instances infection was transferred to other g. pigs, but it could not be maintained in serial passage. Chick embryos could not be infected with this material. A considerable number of g. pigs which survived goose blood and brain inoculations was shown to be resistant to controlled challenge injections of virus.—R. GWATKIN.

SCHLOTTHAUER, C. F. (1941). **The Susceptibility of Dogs to Virus of Equine Encephalomyelitis (Western).**—*J. Amer. vet. med. Ass.* **99.** 388–390.

Experiments to determine the susceptibility of dogs to Western E.E. virus are described. Two of three dogs

inoculated intracerebrally with 0·5 ml. of a 30% suspension of infected g. pig brain showed symptoms of severe disseminated encephalitis and died. The presence of virus was confirmed by inoculation of brain material into g. pigs. One of six dogs inoculated in the right hind foot with 1 ml. of the original suspension also showed symptoms of disseminated encephalitis and was destroyed. Inoculation of brain material from this dog into g. pigs gave negative results. The other dogs remained normal.—D. D. OGILVIE.

GRAHAM, R., & LEVINE, N. D. (1941). **Studies on Equine Encephalomyelitis. I. Antigenic Properties of Pigeon-Brain-Tissue Vaccine.**—*Amer. J. vet. Res.* **2.** 430–435.

Western E.E. pigeon-brain virus was passed through a series of ten pigeons by intracranial inoculation of 0·1 ml. of a one in a million dilution. The brain tissue of inoculated pigeons was found to contain approximately five billion intracranial pigeon lethal doses, or a hundred million g. pig lethal doses per gramme, *i.e.* 20,000 times more concentrated than in horse-brain tissue and 50 times less than in chick-embryo tissue.

A vaccine made by treating a 20% suspension of the virus with 0·5% formalin for 48 hours at room temperature, protected g. pigs when it was given subcutaneously in two doses of 0·5 ml. at weekly intervals, two weeks before the infecting dose. The same dose did not protect pigeons, but two 1 ml. doses enabled two pigeons out of six to survive artificial infection.

—ISOBEL W. BURTON.

HENDERSON, J. A. (1942). **An Outbreak of Ovine Rabies.**—*Vet. Med.* **37.** 88–89.

In an outbreak of rabies caused by dog bites in a flock of 835 adult sheep and 500 lambs, 60 mature ewes and 18 lambs died. Symptoms in affected sheep included increased sexual desire, pulling out of the wool, adoption of a bellicose attitude, and frequent fainting fits. Death occurred 48 hours after the onset of locomotor paralysis. The differential diagnosis from listerellosis is discussed.—D. D. OGILVIE.

CASSELLS, R. W., & LAMONT, H. G. (1942). **Aujeszky's Disease in Dogs.**—*Vet. Rec.* **54.** 21.

Aujeszky's disease in dogs in the United Kingdom is recorded for the first time. The subjects were a Scottish collie bitch aged seven years, and a Scottish collie dog aged 14 months. Both succumbed within 24 hours of the appearance of initial signs of disease. The symptoms comprised marked thirst, and great irritation of the left side of the face. Subsequent rubbing and scratching caused extensive loss of hair and swelling and abrasion of the mouth and lips. Inoculation of brain material into rabbits produced symptoms of Aujeszky's disease in 50 hours. Infection was probably introduced to the dogs by a rat killed by them three days before the symptoms appeared.

—D. D. OGILVIE.

WHITNEY, L. F. (1941). **Vaccine Dosage in Canine Distemper.**—*Vet. Med.* **36.** 420–423.

Inoculation of 169 young dogs with various doses of commercial distemper vaccine, the dogs being exposed to natural infection, established solid immunity in 86 cases. Of the remainder, 59 contracted distemper but recovered, and 24 died. Of 155 controls, similarly exposed, 107 succumbed. To secure solid immunity it was necessary to use fresh material and to grade the dose according to the size of the dog. For large animals a dose of at least 20 ml. is suggested.—D. D. OGILVIE.

ABONYI, L. (1939). Gyógyitási kisérletek a magyar szopornyica elleni szérummal. [**Experiences with a Hungarian Dog Distemper Serum**].—*Állatorv. Lapok.* **62.** 160–163.

All but two of 28 cases of acute dog distemper, treated with homologous serum produced in Hungary, recovered. The serum was administered subcutaneously, intravenously, or intraperitoneally in doses of 50–70 ml. and the dosage repeated when necessary. Intraperitoneal injections administered at the onset of the disease were particularly favourable. Symptomatic treatment and regulation of diet were strictly observed.

—J. CSONKA.

HERZBERG, K., & GROSS, W. (1940). Untersuchungen über Influenza. II. Mitteilung: Isolierung eines filtrierbaren Pneumonieerregers durch den Mäuseversuch. [**Research on Influenza. II. Isolation of a Filtrable Agent through Mice**].—*Zbl. Bakt. I.* (*Orig.*). **146.** 129–139. [For previous part, see *V. B.* **9.** 710].

HERZBERG, K. (1940). Untersuchungen über Influenza. III. Mitteilung: Darstellung des filtrierbaren Pneumonie-Erregers. [**Research on Influenza. III. Demonstration of the Filtrable Causal Agent of Pneumonia**].—*Ibid.* 177–181.

II. The pharyngeal washings from persons with "colds" or "influenza" were inoculated intranasally into mice. In two out of 12 attempts a transmissible pneumonia was produced which was carried through 80–90 passages. The "virus" killed 75–80% of the inoculated mice in 3–6 days and produced lesions of severe pneumonia. The subcutaneous and/or intraperitoneal inoculation of material did not infect the mice, but produced immunity. Nasal or intratracheal inoculation did not produce disease in rabbits or ferrets. The "virus" was filtered with difficulty through a Berkefeld V filter and its viability in glycerin-Tyrode solution was poor.

The authors discuss the possibility that the virus originated in the mice as a result of passage.

III. Histological study of the lungs from the mice used in II showed that the "virus" was a "pleuropneumonia-like" organism. [In view of the work of KLIENEBERGER *et al.* (*V. B.* **10.** 582, and **11.** 14 and 289.), it appears very likely that the infection was latently present in the experimental mice.]—J. FRANCIS.

BROWN, J. W., EATON, M. D., MEIKLEJOHN, G., LAGEN, J. B., & KERR, W. J. (1941). **An Epidemic of Influenza. Results of Prophylactic Inoculation of a Complex Influenza A-Distemper Vaccine.**—*J. clin. Invest.* **20.** 663–669.

It is now known that epidemic influenza in man may be due to two antigenically different viruses (influenza A and B) or it may be of unknown aetiology. The different types cannot be differentiated clinically.

During the course of the epidemic now referred to, 273 individuals were inoculated with a complex influenza A + canine distemper vaccine [see *V. B.* **11.** 767.] and there were 940 uninoculated controls. The incidence of the disease in the control groups varied from 25–43% as compared with 13–15% in those inoculated; in addition antibody tests showed that whereas 84% of the patients in the control group had been infected with influenza A virus, only 55% of the inoculated persons had been so infected. Influenza B virus was not detected.—JOHN FRANCIS.

HENLE, W., & CHAMBERS, L. A. (1941). **The Serological Activity of Extra-embryonic Fluids of Chicks Infected with Virus of Influenza A.**—*Proc. Soc. exp. Biol., N.Y.* **46.** 713–717.

Allantoic fluid is richer in virus and a better source of antigen for serological reactions than amniotic fluid. The pooled fluids can, however, be used as an antigen for the complement-fixation test. The optimum time

for harvesting is about 36 hours after inoculation, but this depends upon the dose of virus used as an inoculum.
—JOHN FRANCIS.

I. SPRUNT, D. H. (1941). **The Effect of the Virus: Host Cell Relationship on Infection with Vaccinia.**—*J. exp. Med.* **74.** 81–89.

II. FRIEDEWALD, W. F. (1942). **Cell State as Affecting Susceptibility to a Virus. Enhanced Effectiveness of the Rabbit Papilloma Virus on Hyperplastic Epidermis.**—*Ibid.* **75.** 197–219.

I. In previous experiments it was observed that the chances of a virus preparation's causing infection in an animal could not be predicted solely by the amount of virus injected and by the host resistance. It seemed possible that a third factor might be the number of cells exposed to each virus particle. This hypothesis was tested by varying the amount of inoculum, preventing spread of the inoculum by previous injections of oestrogenic hormone, and, by the addition of a testicular extract, increasing the spread of the inoculum. The action of the oestrogenic hormone was shown to be due to a local and not to a general effect on the experimental rabbits.

The results of all the experiments indicated that the more cells exposed per virus particle the greater was the chance of a lesion developing; the work emphasizes the importance of the cell-virus relationship in virus experimentation.

II. Normal rabbit skin can be infiltrated with large amounts of highly pathogenic virus without the production of papillomas. Furthermore, when papillomas do arise they occur where the needle has caused injury, but tarring of the skin produces a horde of growths in the surrounding infiltrated tissue. It may be remembered that bacteriophage multiplies only in the presence of young cells and that the first evidence of infection with vaccinia and virus III is found in the regenerated cells resulting from scarification. Ordinary scarification, however, removes nearly all the surface epithelial cells and probably entails a loss of most of the virus in the resulting scab.

In this study it was found that pre-treatment with a number of agents, the most effective of which were 0·3% methylcholanthrene in benzene and a mixture of equal parts of turpentine and acetone, rendered rabbit skin abnormally susceptible to papilloma virus. 3–6 applications at two-day intervals produced a maximum effect which disappeared 2–4 weeks after discontinuation of the treatment; the titre was increased 10–100 times. Treatment of the skin after inoculation had no effect. The various agents which enhanced susceptibility all did so by causing increased cell proliferation and vascularity of the epidermis; they were not necessarily carcinogenic.—JOHN FRANCIS.

*LEVI, M. L. (1940). Contribution à l'étude des conjunctivites rickettsiennes des petits ruminants. [*Rickettsia conjunctivae* **Infection in Small Ruminants in France**].—*Ann. Inst. Pasteur.* **64.** 542–557. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **139.** 341].

A transmissible conjunctivitis of small ruminants, caused by rickettsia, has been recognized in Africa for about ten years [see *V. B.* **7.** 524.], and more recently also in parts of France. Cases occur all the year round, but particularly in summer. Both eyes are usually affected, one a few days after the other. Recovered sheep or cattle may remain active carriers, rickettsia surviving for months in apparently normal conjunctivae. Transmission is by direct contact and, as in other rickettsial infections, vectors play a part. The chief symptoms are reddening of the eyelids, purulent lachrymation, photophobia, and all the signs of severe conjunctivitis. After about 20 days, "follicular conjunctivitis" usually develops. Cases of primary infection clear up very slowly, in 1–5 months, whereas reinfections heal rapidly, in a few days or weeks, except for a chronic affection characterized by persistent raised "follicles". Reinfection may be without clinical symptoms, however, especially in older animals of an infected herd. Rickettsia about $0{\cdot}3 \times 1{\cdot}5\mu$ are numerous in the epithelial cells of the affected conjunctiva. Occurrence of rickettsia outside the cells may be due to rupture of cells during the preparation of smears. There is considerable variation in the shape of the organism.

I. MITSCHERLICH, E. (1941). Behandlungsversuche bei der spezifischen Ceratoconjunctivitis (Rickettsiose) der Schafe in Deutsch-Südwestafrika. [**Treatment of Rickettsial Conjunctivitis of Sheep in South-West Africa**].—*Arch. wiss. prakt. Tierheilk.* **76.** 407–413.

II. MITSCHERLICH, E. (1941). Die spezifische Keratokonjunktivitis (Rickettsiose) der Schafe in Deutsch-Südwestafrika. [**Specific Rickettsial Conjunctivitis of Sheep in South-West Africa**].—*Berl. Münch. tierärztl. Wschr.* Aug. 22nd. 408–411.

III. MITSCHERLICH, E. (1941). Die aetiologische Bedeutung von Rickettsia conjunctivae (Coles 1931) für die spezifische Kerato-Konjunktivitis der Schafe in Deutsch-Südwestafrika. [**The Aetiological Importance of *R. conjunctivae* in the Specific Kerato-Conjunctivitis of Sheep in South-West Africa**].—*Z. InfektKr. Haustiere.* **57.** 271–287.

I. A brief description is given of the symptoms of rickettsial conjunctivitis in sheep, and it is pointed out that the condition may lead to ulceration of the cornea, rupture of Decemet's membrane and prolapse of the iris, resulting in damage to vision which handicaps the animal in its search for food. In the majority of cases no permanent damage to vision occurs, but pigmentation of the cornea decreases the value of the animal for breeding purposes. Experimental treatment was carried out with mercury perchloride solution and ointments containing yellow oxide of mercury, uleron, and rivanol. The best results were obtained with an ointment containing 1% rivanol and 2% uleron.

II. The clinical picture of rickettsial conjunctivitis in karakul sheep in South-West Africa is described. The decrease progresses through four stages, inflammation of the eyelids, corneal opacity, injection of the cornea, and finally the formation of small abscesses and ulceration of the cornea. Recovery may occur before the disease has progressed through all four stages, and usually no permanent damage to the eye results. The lesions produced in the cornea consist of a leucocytic infiltration of the corneal substance, which is most marked under the basal cells of the epithelium. As the disease progresses, capillaries extend into the cornea, and leucocytes invade the epithelium, the basal cells of which become vacuolated and the outer layers desquamated. The condition only rarely progresses to corneal ulceration.

III. The clinical picture of rickettsial conjunctivitis is again described, emphasis being laid on the four stages through which the disease may progress, and on its greater prevalence in an infected flock in the lambs (76%) than in adult animals (3–10%).

Investigations were undertaken to ascertain whether the disease was due to grass seeds or pollen, or to bacteria, with negative results, but material from the eyes of infected lambs introduced into the conjunctival sac of healthy animals produced the disease in 2–10 days. It is considered that rickettsia are the cause of this specific conjunctivitis as they are regularly present in the eyes of infected animals, and material in which

they are present is infective. The leucocytic invasion of the cornea is also correlated with the stages of the rickettsial invasion.

It is suggested that flies act as carriers of the infection, the disease spreading at a time of insect prevalence, whilst flies collected from the heads of infected lambs appeared to be able to set up the disease in healthy animals on which they were placed.

Recovered lambs developed little immunity, and animals could be reinfected experimentally 25 days after the disappearance of symptoms. A virus reservoir is believed to exist, and rickettsial bodies could be detected in the conjunctival epithelium of sheep with corneal pigmentation resulting from a previous rickettsial conjunctivitis, but not in sheep which had recovered without this blemish. Rickettsia were not detected in scrapings from the penis of rams or the vagina of sheep, nor did such material produce conjunctivitis when introduced into the conjunctival sac of lambs, and there appears to be no evidence that ovine conjunctivitis resembles human trachoma in invading the genital mucous membranes.—U. F. RICHARDSON.

ENIGK, K. (1942). Eine Rickettsieninfektion beim Bison. **[A Rickettsial Infection in Bison].**—*Berl. Münch. tierärztl. Wschr.* Jan 23rd. 25–27.

A Canadian bison imported into Germany was kept in quarantine under observation for several months. Blood smears from the bison failed to reveal any infection. When blood was injected into a calf, the latter developed a febrile reaction lasting three days, and rickettsia appeared in its blood, but there were no further clinical symptoms. These rickettsia occurred in the polymorphonuclear neutrophile leucocytes either as oval bodies 4–6μ in diameter, or as colonies of rickettsial granules, the individuals of which measured 0·2–0·4μ.

The infected bison was killed *in extremis*, and a description of the P.M. findings is given, but it is suggested that the lesions and the death of the animal were more probably due to sarcosporidia than to the rickettsial infection. It was thought that the rickettsial infection had probably been contracted in Canada, although the animal had been imported into Germany 3½ years previously.

Attempts to infect mice and g. pigs, either from the bison or from the calf, were unsuccessful.—U. F. R.

CARMICHAEL, J., & FIENNES, R. N. T.-W. (1942). **Rickettsia Infection of Dogs.**—*Vet. Rec.* **54.** 3–4.

Canine typhus as it occurs in Uganda is described, and notes are given on diagnosis and treatment. The disease occurs either in a cutaneous form with erythemato-pustular lesions most clearly seen in the unpigmented areas of the axilla or groin, often unaccompanied by any marked general symptoms, or in a septicaemic form with high fever and injection of the mucous membranes, the gums developing a characteristic purplish colour. On palpation of the abdomen, the spleen is found to be enlarged but not painful, but pain may be exhibited in the region of the bladder and over the loins and thorax. Urinary examination reveals a few casts and numerous cells of transitional epithelium. A nervous form has not been encountered in Uganda.

An infected animal may harbour the parasite for some months, and in reaching a diagnosis clinical examination must be taken into account. During the first four days of fever it is often difficult to find rickettsia in the monocytes, but the blood platelets are often increased in number and after Giemsia staining may be observed to be packed with crimson-staining bacilliform bodies. After this stage rickettsia may be detected in the monocytes as coccoid or bacilliform bodies, and about the 13th day the monocytes are enormously increased and appear in atypical forms. The bacilliform bodies are considered of greater diagnostic value than the coccoid forms.

Sulphonamide preparations are very effective in treatment, sulphapyridine being considered more effective than proseptasine. The dose recommended is 1 g. daily for five days, per 8 lb. body weight, the daily dose being given in four portions. The temperature should fall to normal in 3–4 days, but if it fails to do so the dose must be progressively increased. During treatment no purge may be given, but precautions in regard to feeding of eggs and other sulphur-containing foods have been found to be unnecessary. No cases of toxic action of sulphonamides in dogs have been encountered.—U. F. RICHARDSON.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

RUNNELLS, R. A., & BENBROOK, E. A. (1941). **Connective Tissue Tumors of Horses and Mules.**—*Amer. J. vet. Res.* **2.** 427–429.

This is a record of the age incidence, classification, location, and size of 156 operable connective tissue tumours in horses and mules. Sixty-five were benign, and 91 were malignant. The benign tumours were not confined to any particular age group, but sarcomas predominated in animals 1–4 years of age. Fibromas constituted 50% of the benign tumours and fibrosarcomas made up 89% of the malignant tumours. A noticeable fact was that fibromas often arose on the site of previous injury. Benign tumours occurred most commonly on the head and in the nasal passages. Of the sarcomas, 39% were removed from the head and nasal passages, 30% from the limbs, and the rest from various regions of the body surface.—I. W. BURTON.

*BÜKER, W. (1940). Ueber Nebennierengeschwülste beim Rind. **[Adrenal Tumours in Cattle].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 295].

In 84,000 P.M. examinations, 72 cases of adrenal tumors were found. Most of these were chromoblastomas; one chromocytoma and one neurinoma were found. Most tumours occurred in animals of six years or over. The tumours had no detrimental effect on the health of the animals.—H. BLASCHKO.

ROUS, P., & KIDD, J. G. (1941). **Conditional Neoplasms and Subthreshold Neoplastic States. A Study of the Tar Tumours of Rabbits.**—*J. exp. Med.* **73.** 365–390.

When carcinogenic agents such as tar are applied to the skin of the rabbit or mouse they almost always produce benign growths ("warts") some time before malignant tumours appear. The authors have investigated the problem of whether such "warts" are true neoplasms. In the rabbit these "warts" only become malignant after a period of months or years, and then in but a small proportion of cases. They are of three types, *viz*, papillomas, carcinomatoids and "frill horns", and all of them are true tumours of benign nature and composed of epidermal cells which have undergone slight but irreversible deviations from normal. Such neoplastic cells persist for some time after the original neoplasm has disappeared and can again develop neoplastic characters by non-carcinogenic stimulation, *e.g.* turpentine or wound healing. In the absence of such stimulation they probably eventually die or are shed.

Further stimulation of epidermal cells of tar "warts" by carcinogens produces still greater deviation from normal, resulting finally in a malignant tumour. In tar tumours, neoplasms induced by viruses, and in many human carcinomas these successive step-like deviations result in greater malignancy.

The authors consider that their findings afford further support for the view that tumours are due to viruses rather than to somatic mutations.—E. G. WHITE.

LOEB, L., & SUNTZEFF, V. (1941). **Growth Processes in Mammary Glands of Mice of Strains Differing in Incidence of Mammary Carcinoma.**—*Arch. Path.* **32.** 739–759.

It is known that two factors are concerned in the development of mammary cancer in mice, *viz*, hereditary factors and ovarian hormones. Different strains of mice have different cancer incidences. In order to study the influence of varying hormone activity on this fact, studies were made on 756 mice of seven strains, a proportion of them being subjected to oestrogen treatment. It was found that the appearance of cancer was linked with mammary growth or activity, this in turn being due to endocrine activity. Conversely, tendency towards mammary quiescence was linked with low cancer incidence.—J. E.

I. STRONG, L. C. (1939). **Chemical Studies on the Nature of Susceptibility to Spontaneous Carcinoma of the Mammary Gland in Mice.**—*Yale J. Biol. Med.* **12.** 255–268.

II. STRONG, L. C. (1941). **Chemical Studies of the Susceptibility to Spontaneous Carcinoma of the Mammary Gland in Mice. II. Indications for the Analysis of a Genetic Factor of Susceptibility to Non-genetic Influences.**—*Arch. Path.* **32.** 420–424.

[Author's summaries copied *verbatim*].

I. (1) The tolerance of the anti-oxidant salicylic aldehyde (diluted with olive oil) is determined, in part, by body weight, age, and "genetic constitution" of the individual.

(2) The tolerance of A [strain] male mice reaches the maximum value at that age when the haemoglobin level is highest, *i.e.*, between 101 and 200 days of life. Following that period tolerance decreases.

(3) The C_3H, A and JK strains of mice can be classified in the same sequence according to (*a*) tolerance of the males to salicylic aldehyde, (b) shifts of haemoglobin per unit of time, and (c) the tendency for breeder female mice to give rise to, or not to give rise to, spontaneous tumours of the mammary gland.

(4) The male mouse is probably endowed with part of the physiological mechanism or mechanisms which, in breeder female mice lead to spontaneous carcinomas of the mammary gland.

(5) The oxidation-reduction phenomena of the body may be involved in the mechanism that determines, in part, susceptibility or resistance to spontaneous carcinomas of the mammary gland.

(6) By such a conception a consistent interpretation of genetic susceptibility and the physiological states leading up to the neoplastic condition may eventually be worked out.

II. Tolerance to the lethal effects of salicylaldehyde parallels and may be used as a measure of the intrinsic susceptibility which partly determines carcinoma of the mammary gland in mice.

The genetic factor or factors may exert an influence on the individual prone to have carcinoma of the mammary gland at some future time apparently in two directions: (1) the development of the physiologic state of the organism of which tolerance to the lethal effects of salicylaldehyde may be an index and (2) the physiologic state of the mammary gland as influenced by hormones.

KLEINENBERG, H. E., NEUFACH, S. A., & SHABAD, L. M. (1940). **Endogenic Blastogenic Substances.**—*Amer. J. Cancer.* **39.** 463–488.

Observations are reported on 489 mice which received repeated injections of benzene extracts of human livers and of bile extracts from cancerous and non-cancerous patients. The injections resulted in the formation of many different kinds of tumours and included benign and malignant tumours of connective tissue, mammary glands, skin, sebaceous glands, maxillae, stomach, and liver. The type of the tumour which affected the human subject from whom the liver was taken had no relation to the type of tumour produced in the mice and most of the mouse tumours appeared in parts of the body remote from the site of inoculation. These results are taken to prove that human liver contains blastogenic substances extractable by means of benzene.—R. ALLCROFT.

DU VIGNEAUD, V., SPANGLER, J. M., BURK, D., KENSLER, C. J., SUGIURA, K., & RHOADS, C. P. (1942). **The Procarcinogenic Effect of Biotin in Butter Yellow Tumor Formation.**—*Science.* **95.** 174–176.

The protection against hepatomas, which was afforded to rats receiving butter yellow by supplements of riboflavin and casein, could be broken down by the administration of either biotin concentrates or crystalline biotin.—ALASTAIR N. WORDEN.

GUIDRY, W. (1939). **Inherent Resistance of S. C. White Leghorns to Iritis as a Manifestation of Fowl Paralysis.**—*Thesis, Louisiana.* pp. 59.

An attempt to evaluate the importance of breeding in the control of fowl paralysis (neurolymphomatosis gallinarum) was made in a study of the research data on the Louisiana agricultural experiment station's flock of Single Comb White Leghorns for the year 1938. Observations of 396 mature progeny from 78 dams mated to nine sires were made. All birds considered had been raised under management similar to practical conditions. Iritis, the predominating symptom of the flock studied, was used as a criterion of the infection. Actual paralysis was also considered. Eye examinations commenced when the birds were approximately eight weeks of age, and continued monthly thereafter to maturity. Various types of matings had been made in the effort to cultivate resistant and susceptible lines, and to determine whether the progeny from these matings exhibited resistance or susceptibilty in accordance with the type of mating from which they came.

The progeny from the different matings exhibited variable degrees of positive infection. Groups of pullets selected for susceptibility or resistance in several cases failed to furnish clear evidence of these qualities in their progeny. Sister pullets varied greatly in the production of resistant or susceptible progeny. A distinct individuality existed among females. There were marked inherited differences in the degree of susceptibility and resistance of birds between families, and between progeny of the same family. Of the total progeny observed, 22·98% showed positive affection. The progeny from susceptible and resistant parents exhibited 58·14% and 40% affection respectively. This difference was statistically significant. Results of reciprocal susceptible-resistant matings varied materially. Tests for homogeneity revealed that the sires used produced results more variable than can be attributed to chance alone. This is interpreted to mean that these were inherent differences. Cross-breeding failed to decrease materially the incidence of iritis in the resultant cross-bred progeny.—HERBERT L. GILMAN.

IMMUNITY

LEGG, J., & MAUNDER, J. C. J. (1941). **Synthetic Medium Tuberculins: The Behaviour of the very Advanced Case of Tuberculosis.**—*Aust. vet. J.* **17.** 229–231.

Details are given of the reactions to intradermal tuberculin in 42 advanced cases of TB. Several different tuberculins were used. Twelve cattle gave positive reactions and 11 were definitely negative, while 19 showed small swellings which were difficult to interpret. —W. I. B. BEVERIDGE.

RIGLOS, A. (1941). La tuberculina de Koch y las tuberculinas purificadas en la profilaxia de la tuberculosis bovina. [**Koch's Tuberculin and Purified Tuberculins in the Control of Bovine TB.**].—*Rev. Med. vet., B. Aires.* **23.** 378–391. 1 appendix.

A description of known methods of preparing tuberculin.—MILLER WATSON.

HRABIK, E. (1941). Zur Frage der Standardisierung der Agglutination bei der Bangdiagnose. [**Standardization of the Agglutination Test for Bovine Brucellosis**].—*Z. InfektKr. Haustiere.* **57.** 311–324.

The agglutinability of a standard suspension of antigen sent by STABLEFORTH (" S "), containing 0·24% bacteria by volume was compared with that of two suspensions of antigen prepared by the usual method of the Vienna veterinary school (" K "), one freshly made and the other over one year old. The processing of " K " included removal of free endotoxin, and at the same concentration as " S ", it has an opacity equal to a 75–80% suspension of " S ". The standard dried serum sent by Stableforth agglutinated " S " 100% at 1 : 320 and 25% at 1 : 480–1 : 520, as had been found in England, and the " K " suspensions at 1 : 640 and 1 : 1,000 respectively. The " S " and " K " suspensions were next compared with five sera, " K " being used at the same strength as " S ", and the serum tested from dilutions of 1 : 4, and also by the usual Vienna technique with the first dilution of 1 : 12·5. The concentrated " K " was again about twice as sensitive as the " S ", and the dilute " K " about 3⅓–3½ times as sensitive as the concentrated " K ".

Finally a series of 190 specimens of sera was tested by the Vienna and London methods, a " K " suspension of London strength being used as antigen in the latter series. Both tests agreed in reporting 128 as negative, 40 as positive, and 5 as doubtful. The remainder gave a higher titre by the Vienna method. The dilute antigen is regarded as preferable since it reveals small changes in titre which may be of significance in cases of early infection.—J. G. CARR.

MILOVIDOV, V. S. (1939). O vliyanii nekotorykh fiziko-khimicheskikh faktorov na izmenenie svoĭstv brutselleznogo antigena i syvorotok, upotreblyaemykh dlya postanovki r. Raĭta. [**The Influence of Certain Physico-Chemical Factors on Changes in the Quality of Brucellosis Antigens and Sera Used in the Agglutination Test**].—*Sovyet. Vet.* No. 5. p. 34.

M. found that single or repeated freezing of antigens, even when thawing is carried out slowly, causes permanent changes in the material treated and renders it unsuitable for use in the aggln. test. Conservation in phenol, even in a strength of 5%, of positive brucella sera does not impair their aggln. properties nor influence the reactions.—A. MOLDAWSKY.

GOLUBEV, I. E. (1939). Normal'nyĭ titr krovi loshadeĭ s brutselleznym antigenom. [**Normal Reaction of Equine Blood to Brucella Antigen**].—*Sovyet. Vet.* No. 5. pp. 31–34.

To decide upon the titre to be taken as an indication of brucella infection in horses, G. examined three groups of horses. The first group consisted of 351 healthy pure-bred Orlov trotters, brabansons, and cross-breds, the second of 631 horses from farms in which brucella infection was present, and the third of 122 positive reactors to the allergic and agglutination tests. None of the horses of the first group reacted at a dilution of 1 : 50, whereas 2% in the second group did so. 64·72% reacted at a dilution of 1 : 100, 39·3% at 1 : 200, 18% at 1 : 400, 6·5% at 1 : 800, and 4·9% at 1 : 1,600.

G. considers that a reaction of 1 : 40 or less is to be regarded as negative.—A. MOLDAWSKY.

RANSMEIER, J. C., & EWING, C. L. (1941). **The Agglutination Reaction in Tularaemia.**—*J. infect. Dis.* **69.** 193–205.

Antigen preparation and agglutination technique are described in a serological study of 87 non-fatal and ten, previously unpublished, fatal cases of tularaemia, as well as of 35 fatal cases collected from the literature. A comparison of agglutinin production in fatal and non-fatal cases gave comparable high titres at the same chronological stage of the disease and the persistence of agglutinins in the blood for years after recovery was demonstrated, except in one case where agglutinins were absent after 3½ years. The sera of 54% of 24 persons who had handled market rabbits over long periods contained agglutinins for *Bacterium tularense*. Cross-agglutination of *Br. abortus* occurred with 10% of *Bact. tularense* antisera having a titre of 1 : 320 or more and cross-agglutination of *Bact. tularense* was obtained with 21% of *Brucella abortus* antisera having a similar titre. Variation in concentration of antigen appeared to influence the end-titre of both antisera. Zone phenomena were met with more frequently in sera from undulant fever than from tularaemia, only pro-zones being observed in both and in only a small total of sera. Results confirmed the published findings of FRANCIS & EVANS (1926).—R. O. MUIR.

NUNGESTER, W. J., & LEWIS, S. R. (1941). **Application of " Falling-Drop " Measurement of Density to Quantitative Determination of Antibody in Immunological Reactions.**—*Proc. Soc. exp. Biol., N.Y.* **48.** 425–427.

Dilutions of type I pneumococcus polysaccharide in 0·85% saline in which 1·0 ml. contained up to 0·25mg. of polysaccharide, were adjusted to the same density with added solid sodium chloride, mixed with an equal amount of specific antiserum and allowed to stand overnight in the ice-chest. After removal of the precipitates by centrifugation, the supernatant fluids were tested for nitrogen content by Pregle's modification of Kjeldahl's method and the amount of precipitable nitrogen was estimated by difference. The falling drop method of BARBOUR & HAMILTON for the determination of the concentration of protein solutions was used to estimate the densities of the supernatant fluids. The constancy of the ratio of falling drop time to the amount of precipitable nitrogen denoted the close parallel between the data obtained by the two methods. The falling drop method eliminated the only serious disadvantage of the method of precipitable nitrogen estimation, *viz*, the time required.—R. O. MUIR.

I. MORRIS, M. C. (1940). **The Effect of Dilution on the Reaction between Pneumococcus and its Specific Antibody.**—*J. Immunol.* **39.** 369–381.

II. MORRIS, M. C. (1941). **The Effect of Dilution on the Reaction between Pneumococcus and its Specific**

Antibody. II. The Dilution Phenomenon.—*Ibid.* **42.** 219–237.

I. Mice were used to demonstrate the different degree of sensitization of pneumococci with antiserum, according to which was used of two contrasting methods of preparing the same mixtures. Experiments showed that greater protection of mice occurs if a given concentration of culture and serum is arrived at by diluting a mixture of more concentrated reagents, than if the same final dilutions of each reagent are prepared directly and then combined and injected into mice without further dilution. There is, however, less disparity if the dilute reagents are allowed to remain in contact for a longer time. The aim of the work was to throw light on the problem of the *in vitro* neutralization of viruses and it is concluded that the fundamental mechanism governing immune reactions is the same whether the antigen be bacteria or viruses.

II. It was shown that the pneumococcus can form *in vitro* a firm union with its antiserum, and the pneumococcal sediments after this sensitization may be completely noninfectious even if washed free from excess antiserum. A dilution phenomenon therefore cannot be demonstrated with mixtures if the organisms are all sensitized, but if the contact between the antigen and antiserum is very short, the incompletely sensitized organisms show the dilution phenomenon. The apparent reactivation of the mixture occurs when the dilution of excess antiserum to an ineffective level allows the unsensitized organisms to infect.

The discussion relates the above findings to the problem of the occasional poor union between antibody and antigen as seen in other bacteria, viruses, phage, and toxins.—J. KEPPIE.

HERSHEY, A. D. (1940). **The Rôle of Diffusion in the Pneumococcus-Antipneumococcus Reaction.**—*J. Immunol.* **39.** 383–396.

A series of formulae is presented for the estimation of the amount of rabbit antipneumococcal antibody required for sensitization, and for saturation of the surface of a single pneumococcus, together with the time and concentration of antibody necessary for sensitization and the disposition of antibody on the cell surface. Results of protection experiments in mice confirmed the absolute rate of the pneumococcus-antipneumococcus reaction predicted by the diffusion theory, and the indifference of the reaction to temperature provided independent evidence in support of the conclusion that each antibody molecule impinging upon the free cell surface was irreversibly bound.—R. O. M.

HERSHEY, A. D. (1941). **The Absolute Rate of the Phage-Antiphage Reaction.**—*J. Immunol.* **41.** 299–319. [See also preceding abst.]

The physical aspects of the rate of initial combination of a coliphage and antiphage are given and results differ from the previously studied pneumococcus-antipneumococcus reaction. It is estimated that at 0°C. only about one out of 500,000 collisions between the reactants results in combination.

Possible causes of the slowness of this reaction are discussed and assumptions are made about the molecular nature of antigens and antibodies.—J. KEPPIE.

CROOK, E. M. (1942). **The Nagler Reaction: The Breakdown of Lipoprotein Complexes by Bacterial Toxins.**—*Brit. J. exp. Path.* **23.** 37–55.

The fraction in Type A *Cl. welchii* toxin which produces opalescence, or a curd of fatty material, in human serum or hen-egg yolk has been identified with the α toxin of GLENNY, and the reaction has been used to titrate antitoxin.

The fact that the Ca ion is necessary for the Nagler reaction was confirmed, and it was found that the susceptibility of various human sera might vary by as much as 25 : 1. Variations in the sensitivity of egg-yolk saline were not nearly as marked. Sera of hens, particularly laying hens, gave the reaction but horse, pig, sheep, and rabbit sera were insensitive. Opalescent haloes have, however, been noted around *Cl. welchii* colonies or horse-serum agar plates.

The material responsible for the turbidity was found to be not a simple fat but a complex lipoid representing all the lipoids present in either serum or egg-yolk together with protein.

There was a close correlation between the titration of *Cl. welchii* Type A toxin on mice, and by the Nagler reaction. The reaction is also given by the other types of *Cl. welchii*, but NAGLER believed that clostridia other than *Cl. welchii* did not give the reaction. Under optimum conditions, however, filtrates from seven other species of *Clostridium* and a strain of *Pseudomonas pyocyanea* gave positive Nagler reactions. Homologous, but not heterologous, antitoxic sera inhibited the reaction. Some pathogenic organisms did not produce a Nagler reaction and *vice versa*.

The kinetics of the reaction, together with the thermolability and non-diffusability of the agent, indicate that the reaction is due to an enzyme or enzymes, and a lecithinase has already been postulated [see MACFARLANE *et al.*—*V. B.* **11.** 461, and MACFARLANE & KNIGHT—*V. B.* **12.** 335]. The mechanism of the reaction is, however, extremely complex.—J. FRANCIS.

HEIDELBERGER, M., & MAYER, M. (1942). **Quantitative Chemical Studies on Complement or Alexin. IV. Addition of Human Complement to Specific Precipitates.**—*J. exp. Med.* **75.** 285–295. [For previous parts, see *V. B.* **12.** 341].

An explanation is given of the discrepancy in the results of comparative titrations of human and g. pig complements, due to the deficiency of unfractionated human complement in the second component or "endpiece" (C′2), despite the fact that it contained as much of the first or combining component or "midpiece" (C′1) as g. pig serum, the usual standard in complement studies. Human complement was titrated by a modified method so that C′1 titres were measured as in g. pig serum instead of the C′2 titres yielded by the usual titration. The deficient components of human complement were fortified by the addition of supernatant from g. pig serum from which the C′1 or combining component had been removed by measured amounts of specific precipitate formed by interacting homologous antigen-antibody mixtures. The measurement of complement-combining component or components of human serum in absolute weight units instead of in relative terms, as carried out for g. pig serum, yielded similar values, *viz*, 0·03–0·05 mg. of complement nitrogen per ml. of serum. Further similarities recorded in human and g. pig complements were discussed.—R. O. MUIR.

WEHMEYER, P. (1941). Versuche über Destruktion von Komplement. **[Research on Destruction of Complement].**—*Z. ImmunForsch.* **100.** 179–197.

If the inactivation of complement by heat is a monomolecular reaction, it should proceed according to the equation $-\frac{dp}{dt} = Kp$, where p = the amount of complement still active after a time t. From this is derived the equation $\log. p_1 = Kt + c$, where p_1 is the amount of complement needed to give 50% haemolysis after inactivating for a time t, and K is the velocity of

the reaction. A graph of the values found for log p_1 and t should give a straight line if the reaction is indeed monomolecular, the slope of which line = K. The values found by experiment agreed with the requirements for a monomolecular reaction over the range 4°–55°C.

The values for K were substituted in the van't Hoff-Arrhenius equation $\frac{K_1}{K_2} = e^{\frac{\mu}{2}\left(\frac{T_1 - T_2}{T_1 \cdot T_2}\right)}$ where T_1, T_2 are the temperatures (absolute) at which the velocity of the reaction is K_1, K_2. The equation was found to hold below 37°C. and above 50°C., having a different value for μ in each range, but not in the intervening range. K was found to vary for different complements below 40°C., but was almost the same for different specimens above this temperature.

The end-piece of complement was most unstable above 50°C. and mid-piece most unstable below 40°C. The value determined for μ outside the range of 40°–50°C. is therefore that of the more unstable component. Precipitation experiments using $(NH_4)_2SO_4$ and normal or inactivated complement indicated that greatest alteration during inactivation was to that part of the protein fraction associated with the mid-piece of complement, presumably by denaturation and dissociation.
—J. G. Carr.

Sarre, H., & Wirtz, H. (1939). Geschwindigkeit und Art der "Nephrotoxin"-Bindung bei der experimentellen Glomerulonephritis. **[Speed and Nature of "Nephrotoxin" Combining in Experimental Glomerulonephritis].**—*Klin. Wschr.* **18.** 1548–1550.

In 1935 Masugi produced an acute glomerulonephritis in rabbits by intravenous injection of serum from ducks immunized against rabbit kidney tissue. This type of nephritis, which is in several respects similar to human glomerulonephritis, seems to be the result of fixation by the rabbit kidney of rabbit kidney antibodies present in the duck serum, *i.e.* an antigen-antibody reaction. The present authors tried the effect of clamping the left renal artery of anaesthetized rabbits for a period of 15 min. during and immediately following the injection of the duck serum. The clamp was then removed and the animals were allowed to live for 7–21 days. The degree of nephritis in the left kidney was always much less severe than that in the right kidney which was not clamped, suggesting that the organ-specific antiserum is rapidly fixed in the kidney. Control experiments in which the left renal artery was clamped for 15 min. before injecting the serum showed nephritis equal in severity in both kidneys and the same effect was produced when both renal arteries were clamped during and after the injection of serum. It appears that a single injection of duck serum can provoke a nephritis which develops either as an acute disease lasting a few days or in some cases becomes chronic and lasts several months, finally producing a chronic contracted kidney.

The above experiments suggest that the mechanism by which the anti-kidney serum acts is "fixation" rather than "excretion", since the latter process could hardly be completed within a period of 15 min.
—E. G. White.

Eisler, D. M. (1941). **Influence of Collodion Particles on the Visible End-Point in Antibody Titrations.**—*J. Immunol.* **42.** 405–418.

In order to obtain more sensitive antigens for agglutination, autolysates of pneumococci, meningococci, and gonococci were combined with a suspension of collodion. It was assumed that the proteins were adsorbed on to the collodion. The resulting titres were much greater than those obtained when whole organisms, or a mixture of organisms and collodion particles, or autolysates alone, were agglutinated with the appropriate antisera. The increased titres were observed with both low and high titred sera. The concentration of the collodion suspension was found to influence the titre, so the optimal concentration had to be determined.

Titres obtained in nonspecific reactions were lower than those obtained by specific mixtures of autolysates, collodion particles, and antisera. Optimal titres were obtained by allowing the collodion to remain suspended in the autolysate. The collodion particles were not washed free of "excess" antigen because of the possible presence of antigenic substances other than adsorbable proteins.—Isobel W. Burton.

Rodrigues, C., & D'Apice, M. (1940). Antitoxina tetanica dosagem no sôro de animais vacinados. **[Estimation of Tetanus Antitoxin in the Serum of Immunized Animals].**—*Arq. Inst. biol., S. Paulo.* **11.** 489–498. [English summary].

The authors used mice instead of g. pigs for the estimation of tetanus antitoxin by the Knerr and Hottle method. It was not found possible to estimate quantities between 0·1 and 0·001 antitoxic units when only one L+ dose was used. By using, however, three different amounts, *i.e.* L+/2, L+/12, and L+/60 it was possible to estimate even minute amounts. The toxin used had a M.L.D. of 0·0005 mg. and L+ of 0·24 mg., *i.e.* approximately 480 M.L.D. per L+. The standard antitoxin was from the Laboratory of Hygiene, Washington.—Miller Watson.

I. Angevine, D. M., & deGara, P. F. (1941). **Haemorrhagic Skin Reactions in Rabbits with Cutaneous Sensitization to Streptococci and Pneumococci (Shwartzman Phenomenon).**—*Proc. Soc. exp. Biol., N.Y.* **47.** 359–362.

II. Ajó, C. (1941). **New Observations on a Primary Ocular Reaction to Shwartzman Toxins.**—*Ibid.* 500–501.

I. Using vaccines and culture filtrates of streptococci and pneumococci, the authors made experiments in rabbits to determine the possible correlation between the degree of skin sensitivity and the characteristic cutaneous haemorrhage which in this phenomenon occurs in the previously injected skin as a result of the provocative inoculation of a homologous substance. A prolonged course of sensitizing intradermal injections was usually necessary.

Some positive results as judged by local haemorrhage were obtained, whereas unsensitized rabbits when similarly tested gave negative results. The most intense haemorrhagic reactions were observed in animals with the highest degree of cutaneous sensitization.

II. This is a report on the marked reaction in the eye of the rabbit following the intravenous injection of "Schwartzman toxins", *i.e.* bacterial factors capable of producing the Schwarzman phenomenon, culture filtrates of a meningococcus and of *Salmonella typhi* being used in this instance. Marked changes developed in the eye, such as vascular congestion, lachrymation, photophobia, etc., which appeared within two hours and had disappeared within 24 hours. Other effects mentioned are severe diarrhoea, enhanced fragility of skin capillaries, exudation into joints, and a high mortality rate. These effects failed to appear in rabbits injected intravenously with similar or larger doses of bacterial filtrates devoid of Shwartzman-reacting potency. The active factors in the toxic filtrates can be neutralized by immune antiserum.—J. Keppie.

PARASITES IN RELATION TO DISEASE [GENERAL]

CHAVARRIA, C. (1941). Parasitos de los animales domésticos. **[Parasites of Domestic Animals in Costa Rica].**—*Bol. téc. Dep. nac. Agric., Costa Rica.* No. 39. pp. 48.

This is a guide to the recognition, diagnosis, and treatment of parasitic affections of domestic animals in Costa Rica. Helminths of ruminants, horses, and swine are dealt with, and helminths and ectoparasites of poultry.—MILLER WATSON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

COBBETT, N. G., & MITCHELL, W. C. (1941). **Further Observations on the Life Cycle and Incidence of the Sheep Bot, Oestrus Ovis, in New Mexico and Texas.** —*Amer. J. vet. Res.* **2.** 358–366.

The authors record observations on the duration of the different stages of *Oestrus ovis*, which indicate that the complete life-cycle may take no more than 3½ months, contrary to the general belief that 10–12 months are required.

The observations were made in New Mexico and Texas, on large numbers of sheep killed at abattoirs or found dead on the range, and were supplemented by observations on artificially infested lambs, and on sheep naturally infested but protected in cages from subsequent infestation.

It was found that a wide variation usually occurred in the rate of development of larvae deposited at any one time; some migrated immediately to the ethmoid turbinates, moulted, and continued their development in the frontal sinuses, whilst others remained for months in the nasal passages as minute, first instar larvae. Those which reached the frontal sinuses developed at varying rates so that, of the same lot of deposited larvae, some might reach maturity and be expelled in as short a time as 25 days, whilst others might continue to infest the head cavities for up to nine months.

In Texas, where the winters are mild, larvae continued to reach maturity, and to be expelled, throughout the year, whereas, in the colder winters of New Mexico, development was interrupted in the autumn, and the infestation survived the winter as first-stage larvae in the nasal passages. The adult fly was observed to be active practically throughout the year in Texas, whereas in New Mexico its season of activity was June–September.

Practically all the sheep examined, both in Texas and New Mexico, were infested, the numbers of larvae per sheep varying from 1–75.—J. MACLEOD.

TRAVIS, B. V. (1941). **Examinations of Wild Animals for the Cattle Tick,** *Boophilus annulatus micro-plus* **(Can.) in Florida.**—*J. Parasit.* **27.** 465–467.

In the course of deer-extermination campaigns in Florida, surveys were made of the wild hosts of the cattle-fever tick, *B. annulatus microplus*. The tick was found on only four out of 22 deer examined, and on no other wild host. A list of the animals and birds examined, and the tick species found, is given.—J. MACLEOD.

DAVIS, G. E. (1941). *Ornithodoros parkeri* **Cooley: Observations on the Biology of this Tick.**—*J. Parasit.* **27.** 425–433.

O. parkeri in the U.S.A. is a parasite of "prairie dogs" (*Cynomys* spp.), jack rabbits, cottontail rabbits, mice, ground squirrels, weasels, and burrowing owls (*Speotyto cunicularia*) and it readily feeds on man, white rats, g. pigs, and monkeys.

D. discusses diseases with which this tick may have associations, *viz*, human relapsing fever, human Rocky Mountain spotted fever, American "Q" fever, and tularaemia. He also discusses the feeding habits of the tick and certain other points concerning its habits and life-history.—J. MACLEOD.

*PAVLOV, P. (1940). Epizzoozia di parasiti da zecche nelle capre in Bulgaria. **[Tick Paralysis of Goats in Bulgaria].**—*Riv. Parassit.* **4.** No. 4. 27. [Abst. from abst. in *Tierärztl. Rdsch.* **47.** 194].

The condition affects goats at any age and condition, and to a lesser extent, calves and sheep. Clinical symptoms are typical, but no pathological changes have been found and bacteriological examinations yield negative results. Immunity is not conferred by the first attack, though a second attack is less severe. With incorrect diagnosis or insufficient treatment the mortality may reach 25–50%. The ticks concerned are *Haemaphysalis punctata*, *H. inermis*, and *Hyalomma aegyptium*.

GAPUZ, R. B. (1941). **Sarcoptic Mange in Carabaos: its Occurrence, Transmission, and Treatment.**—*Philipp. J. Anim. Indust.* **8.** 285–291.

A description of sarcoptic mange in three water buffaloes affecting the thigh, neck, and face. They had been kept in isolation for some months during research on foot and mouth disease. Drawings of the mites are given. There are three photographs of the mange lesions and also two figures of a *Psoroptes* isolated from Philippine buffaloes.

The mange was experimentally transmitted by contact to two other buffaloes and to an ox, which were cured by either derris infusion wash or an emulsion of derris with coconut oil.—J. E.

SCHOOP. (1941). Ueber die Fuchsräude. **[Mange in Foxes].**—*Dtsch. tierärztl. Wschr.* **49.** 485–486.

The incidence of fox mange has shown an increase in the period 1936–40. The only organism found in affected animals is a sarcopt, but whether this is a true species or a variety of the canine species is not known. Slight transmission to dogs does occur. The infestation is spread from fox to fox through the medium of infested lairs and during the mating season. In fox farms the disease is introduced by purchased animals that are infested but show no symptoms.

Characteristic symptoms are severe oedema and the formation of very large crusts. The thick fur allows the mites to multiply undisturbed and, if untreated, the condition may end fatally in three weeks. The animal becomes emaciated very rapidly.

To control the disease in an infested district where the animals run wild, all foxes in a five-mile radius should be regarded as infested and destroyed. The use of old lairs must be prohibited as far as possible and especially during the breeding season. In fox farms, dogs should be kept away from the foxes and new purchases should be isolated.

Treatment of the condition is rather difficult because of the thick fur and the large crusts. Shearing is not easy because of the elasticity of the fur and the danger of cold during winter. Dipping is often attended by losses even when only a 2% derris solution is used. The best method of treatment is fumigation by sulphur dioxide although suitable restraint of the animal is difficult. This treatment should last for half-an-hour at least, and, because of the difficulty of treating the head, must be repeated twice at intervals of 6–7 days.

In the fox farm all woodwork and kennels should be disinfected with 2% cresol solution twice within a fortnight, the kennels and runs being unoccupied for 30 days.—A. L. WILSON.

SCHMIDT, H. W. (1941). Sarkoptes-Räude bei Fuchs, Hund und Mensch. [**Sarcoptic Mange in Fox, Dog and Man**].—*Dtsch. tierärztl. Wschr.* **49.** 487–488.

Cases are quoted of transmission from foxes to hunting dogs and from these to human beings. Human beings are also infested by handling mangy foxes. For control of the infestation and the prevention of spread to other animals, mangy foxes should be buried deeply and, apart from really necessary manipulation, should not be handled by human beings.—A. L. W.

SCHMIDT, H. W. (1941). Uebertragung der Sarkoptesräude : Fuchs, Hund, Mensch. [**Transmission of Sarcoptic Mange : Fox, Dog, Man**].—*Wien. klin. Wschr.* **54.** 963–965.

After discussing the transmissibility of mange between foxes, dogs, and man, S. describes a case of sarcoptic mange in a gamekeeper. The disease spread all over the body within ten days of his handling a mangy fox which was caught in a trap. [The circumstantial evidence that the fox had sarcoptic mange and was the source of spread to the man is not complete.] —J. E.

BUXTON, P. A. (1941). **The Parasitology of Scabies.**—*Brit. med. J.* Sept. 20th. 397–401.

This article is a brief review, for the medical practitioner, of the available knowledge regarding scabies and its causal organism, *Sarcoptes scabiei* var. *hominis*. The appearance and life-history are described, and the relation of other varieties, occurring normally on animals, to human scabies is discussed.

The evidence for regarding crusted scabies as an extreme or neglected form of ordinary scabies is reviewed, and the opinion is offered that crusted scabies is either a severe form of human scabies or a case of human infection with a variety derived from an animal ; the possibility of its being due to a mite other than *S. scabiei* is dismissed.—J. MACLEOD.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

HSÜ, H. F., & LI, S. Y. (1941). **Helminths of Dogs in Peiping.**—*Peking nat. Hist. Bull.* **15.** 201–213.

Seventeen species of helminths were found in P.M. examinations of 104 adult pariah dogs in Peiping. Those occurring most frequently were *Echinochasmus perfoliatus shieldsi* in 73 of the dogs, *Dipylidium caninum* in 66, *Dirofilaria immitis* in 54, *Ancylostoma caninum* in 50, *Spirocerco sanguinolenta* in 30, *Clonorchis sinensis* in 29, and the eye worm, *Thelazia callipaeda*, in 18. The two blood parasites, *D. immitis* and *S. sanguinolenta*, are responsible for heavy mortality of dogs in this area. It is interesting to note that *Echinococcus granulosus* is represented only by a single specimen in one dog, and is infrequently found in China generally, although human cases of hydatid disease are not rare. *Cysticercus cellulosae* and *Dracunculus medinensis*, each found previously in two dogs in Peiping, were not found during the present survey. A new dog parasite is *Heterophyopsis expectans major*, a trematode originally recorded only in gulls. The paper includes a summary of the reports of the 38 helminths so far recorded from dogs in China, of which 23 have now been found in Peiping.—E. S.

KOCHETKOV, A. V. (1938). K voprosu rasprostraneniya anoplotsefalidoz u severnykh loshadeĭ. [**Incidence of Anoplocephalids in Horses of North Russia**].—*Trud. vet. Fak. Vologda. sel'skokhoz. Inst.* **2.** 206–208.

Anoplocephala magna and *A. perfoliata* both occur, *A. perfoliata* being the more common. Five examples of *A. perfoliata* had the shape of a regular ribbon ; these, in K.'s opinion, represent a variation.—A. M.

HAGER, A. (1941). **Effects of Dietary Modifications of Host Rats on the Tapeworm** *Hymenolepis diminuta.* —*Iowa St. Coll. J. Sci.* **15.** 127–153.

A high initial producton of eggs is characteristic of this parasite, followed by a more constant rate at a rather lower level. Rats were fed cysticercoids encysted in the flour beetle, *Tribolium confusum*. Faecal egg counts were made every other day. When the food intake was limited to one-third of the normal amount, no decrease in the egg counts was noted. Deficiency of vitamins B_1 and B_2 was followed by a drop in the numbers of eggs eliminated. Since egg production was unaffected by feeding autoclaved yeast, the factor involved is not the labile vitamin B_1. Deficiency of vitamin B_2 led to a decrease in the egg counts, but the factor involved is not considered to be necessarily identical with vitamin B_2. Comparisons of the effects of whole raw milk only and of diets including soya-bean oil-meal and wheat middlings showed that the factor was present in small amounts in milk and in wheat middlings and to a lesser extent in soya-bean oil-meal. There was no direct correlation between daily egg counts and the worm burden, but in heavy infections the egg production of each worm was decreased. Also, as the worm burden increased the cestodes tended to be smaller, and fewer gravid proglottids were found. —M. L. BINGHAM.

DESCHIENS, R., & RENAUDET, R. (1941). La réaction de fixation du complément dans le téniasis à *Taenia saginata.* [**The Complement-Fixation Test in** *T. saginata* **Infestation**].—*Bull. Soc. Path. exot.* **34.** 17–25.

C.-f. tests with an alcoholic extract of *T. saginata* gave positive results in only four of 10 individuals known to be infested with this worm, but in five of 43 uninfested controls. It is suggested that the occurrence of such false positive reactions may be due, in part, to the fact that the antigen, being prepared from worms which are nourished by osmosis of the intestinal chyme, may contain microbial and alimentary substances capable of acting as antigens.—E. S.

GELORMINI, N. (1941). Resistencia de los quistes hidatidicos extraidos del organismo animal. [**Resistence of Hydatid Cysts outside the Body**].—*Inst. Parasit. Fac. Agron. Vet., Univ. B. Aires.* **2.** No. 2. 15–24.

G. found that, when sheep lungs infested with *Echinococcus* cysts were buried, the cysts could only be considered inactive after nine days. Under the same conditions, cysts in sheep liver were inactive after seven days. Cysts retained their viability when kept at 4°C. for 80 days. Cysts in organs left uncovered at normal temperatures could not be considered inactive until about a week had passed. Fly larvae helped in the destruction of the cysts.—MILLER WATSON.

LAWLER, H. J. (1941). **The Relation of Vitamin A to Immunity to Strongyloides Infection.**—*Amer. J. Hyg.* Sect. D. **34.** 65–72.

Resistance of rats to primary infection with *S. ratti* was not affected when the rats were fed on a vitamin A deficient diet until all vitamin A reserves in the liver had been used up ; resistance was then lowered and there

was less immunity to reinfection. The defence mechanism involved was not associated with specialized epithelial tissues as in bacterial infections, but rather with the entire reticulo-endothelial system.—M. L. B.

PRICE, E. W., & DIKMANS, G. (1941). **Adenomatous Tumors in the Large Intestine of Cats Caused by** *Strongyloides tumefaciens*, **n.sp.**—*Proc. helminth. Soc. Wash.* **8.** 41–50.

The authors describe nodular lesions, 2–10 mm. in diameter, which they found irregularly distributed throughout the large intestines of two cats. The nodules were adenomatous and consisted of irregular acini of columnar cells distended with exudate. The parenchyma was supported by a connective tissue stroma. A description is given of adult and larval nematodes, for which the name *S. tumefaciens* is proposed, which were dissected from the acini and stroma.—M. L. BINGHAM.

I. HOWELL, N. G. (1942). **The Public Health Aspect of Trichiniasis.**—*J. R. sanit. Inst.* **62.** 1–5.

II. ANTHONY, D. J. (1942). **Trichinella Spiralis.**—*Ibid.* 5–8.

I. H. is of the opinion that the role of the rat in swine trichinosis has been overemphasized. Examination of rats, caught in Wales, during a three-month period, showed them to be negative for trichinae although rats in England have sometimes been found to be infested. Droppings from rats are infective only if they contain trichinae released from muscles. Her observations agree with the American findings that the method of feeding is the main factor in propagation of swine trichinosis. She is convinced that the recent outbreak in Pembrokeshire was due to feeding garbage and offal to the pigs, and considers that the Foot and Mouth Disease (Boiling of Animal Foodstuffs) Order is often evaded. The intestines of rabbits and home-killed pigs are frequently thrown to pigs, whilst inedible offal from abattoirs is similarly used.

Swill feeding also increases the risk in the case of bacon, for in pigs fed on swill the tendency of the fat to separate into layers makes curing uneven, and results in poor keeping quality and failure of the brine to exert the full effect upon worm-infested muscle fibres.

H. believes human trichinosis to be more common than is generally realized, owing to the similarity of the symptoms with those of such diseases as influenza, rheumatic fever, typhoid, and some eye conditions, and also to the fact that worm infestation is not usually associated with fever.

In view of the negative findings after expert examination of many hundreds of swine carcasses, it is obvious that the microscopic method of diagnosis does not provide an effective means of control of this disease. Preventive measures should include the processing of pork products which are liable to be eaten in the raw state. Heating to 137°F., or chilling at 5°F. for 21 days, destroys the parasite. Safety lies in the thorough cooking of pork and especially of sausages, which have been responsible for most outbreaks in this country.

II. An account of the usually accepted conceptions with regard to swine trichinosis and a suggestion for the establishment of trichinosis diagnosis at abattoirs or regional laboratories.—H. E. BYWATER.

*ROTH, H. (1941). Die Wirkung von Muskeltrichinen in Immunserum. Eine neue Präzipitinreaktion auf Trichinosis. **[A Modified Precipitin Test for Diagnosis of Trichinosis].**—*Acta path. microbiol. scand.* **18.** 160–167. [Abst. in *Helminth. Abstrs.* **10.** 21, copied *verbatim*. Signed: P. A. C.]

Roth describes a modified precipitin test for the identification of trichinosis, which depends on the fact that microscopic precipitates are formed round living larvae of Trichinella when incubated in serum containing specific antibodies. [From an abstract in *Z. Fleisch- u. Milchhyg.* **51.** 146].

OLDHAM, J. N., & WHITE, E. G. (1942). **Chronic Focal Interstitial Hepatitis in the Pig: Preliminary Report on the Effect of Feeding Embryonated Ascaris Eggs.**—*Vet. J.* **98.** 16–17.

Five pigs, 8–11 weeks old, were fed a single dose of 200,000–400,000 infective *Ascaris* eggs and killed at intervals from 48 hours to 27 days after infection. All the pigs had numerous liver lesions resembling those described as "white spot liver" [see *V. B.* **12.** 293]. Eosinophile counts varied from 3·4% at six days after feeding to 15·7% after 13 days. Some of the pigs were found to have a natural infestation with *Ascaris*, but the occasional old "milk spots" were easily differentiated from the more numerous recent foci resulting from the experimental infection. Attempts were made to secure a second series of pigs free from *Ascaris* by selecting them from among the litter of a sow whose faeces did not show any *Ascaris* eggs. Even so, some of the pigs showed ascarids which could not have developed from the eggs of the experimental dose. The P.M. findings resembled those in the first series.

—M. L. BINGHAM.

TAYLOR, E. L. (1942). **The Epidemiology of Parasitic Bronchitis among Cattle.**—*Vet. Rec.* **54.** 15–17. Discussion pp. 88–90.

Parasitic bronchitis is widespread in cattle throughout Great Britain and few animals entirely escape infection. A strong immunity, however, is usually fully established at two years of age. Medicinal treatment of clinical cases in younger animals is unsatisfactory, although several workers claim encouraging results following the administration *per os* of 7–20 ml. of tetrachlorethylene in oil preceded by 2 oz. of 1% copper sulphate solution. For prevention of infection, dry fields and short herbage are generally best. Yards and gateways where cattle congregate are especially dangerous. The most effective method of reducing the amount of infection on pastures is by grazing non-susceptible animals, including healthy adult cattle.

—D. D. OGILVIE.

THRELKELD, W. L. (1941). **Helminth Parasites in Sheep.**—*Tech Bull. Va agric. Exp. Sta.* No. 68. pp. 46.

Strongyloides papillosus and coccidia were observed in lambs as young as five weeks, which had been removed from their dams 48 hours after birth and fed on pasteurized milk alone. Larvae of *Ostertagia circumcincta* kept on loam soil appeared to survive better in the shade than in the sun. They also survived better in loam cultures than in clay or sand. Warm, dry weather over a period of 76 days was lethal to the larvae. Infective larvae retained their viability and infectiveness when exposed on pasture at −10°C. for 5–11 months. Treatment of lambs with 3% copper sulphate, or with mixtures of 2–3% copper sulphate and 1% nicotine sulphate, reduced egg counts to a minimum. This treatment would not control *Ostertagia* under conditions favourable to residual larvae on pasture. Repeated treatment with 2·5–3 ml. of a 10% copper sulphate solution followed immediately by 5 ml. tetrachlorethylene was very efficient against adult *Ostertagia* and *Haemonchus contortus*. Phenothiazine in doses of 0·5–0·6 g. per lb. body weight was equally efficient against these species and also against *Trichostrongylus* spp., *Nematodirus*, *Oesophagostomum columbianum*, *Bunostomum trigonocephalum*, and *Trichuris ovis*. It was less effective against *Cooperia curticei*.—M. L. B.

ÔHAMA, S. (1941). **Observations on Hookworm Disease in Isigaki Island, Okinawa Prefecture. II. Studies on the Mode of Infection of Hookworm among the Population in Kabira Village, especially on the Relation of Soil Infection by Hookworm Larvae to Occupation and Habits of the Population, Domestic Animals, Soil and Atmospheric Phenomena.**—*J. med. Ass. Formosa.* **40.** 1212–1223. [In Japanese : English summary]. [Extract from abst. in *Trop. Dis. Bull.* **39.** 97, copied *verbatim*].

In the faeces of 50 pigs, Ascaris eggs were found in 21, *Strongyloides stercoralis* larvae in 1, and doubtful hookworm eggs in 2.

ACKERT, J. E. (1942). **Natural Resistance to Helminthic Infections.**—*J. Parasit.* **28.** 1–24.

Experimental evidence and epidemiological data indicate that the main factors upon which natural resistance to helminths depends are diet, genetic constitution, and age. Many authors have shown that a diet markedly deficient in vitamins A, B complex, or D, or one with restricted sources of proteins and minerals, will lower the resistance of the host to its nematode parasites.

Racial differences in resistance to infections with hookworms, pinworms, tapeworms, and *Ascaris* have been observed among the negro and white populations in various parts of the U.S.A. In recent years experimental evidence has been noted of breed and strain differences in birds and sheep in their resistance to helminths. The heavier breeds of fowls have shown greater resistance than the lighter breeds, and heavier strains have proved more resistant than lighter strains of the same breed. Cheviot sheep have proved more tolerant than the lowland breeds, and Romney sheep show greater resistance to *Ostertagia circumcincta* than do Shropshires, Southdowns, or Hampshires.

It is well known that increased resistance with age may occur in mammalian, avian, amphibian, and molluscan hosts to trematodes, cestodes, and nematodes. A. suggests that the explanation of this phenomenon depends upon the increase in the number of duodenal goblet cells with age [see also *V. B.* **10.** 431]. As a result of numerous tests on fowls, he concludes that the duodenal mucus from the goblet cells contains a thermostable substance that is harmful to the helminths.—M. L. BINGHAM.

DISEASES, GENERAL

ENIGK, K. (1941). Die Wildkontrolle bei der Tierseuchenbekämpfung in Afrika. **[Game Control in the Campaign against Livestock Diseases in Africa].** —*Dtsch. tierärztl. Wschr* **49.** 495–496.

It is pointed out that game animals are often carrier hosts of such enzootic diseases as trypanosomiasis, anaplasmosis, heartwater, horse sickness and blue tongue, to which they have acquired resistance by long association. Although a considerable amount of work has been done on proving the susceptibility of game to infection with parasites of stock, few attempts have been made to infect stock with parasites detected in game, and the nature of the game infections is therefore not always clear.

In addition to their role as carriers of enzootic diseases, game may also prove susceptible to introduced diseases of stock, and their importance as carriers of the virus of rabies is particularly emphasized. The South African work on the control of the various small mammalian carriers of rabies is referred to as illustrating the necessity for a study of the habits of wild animals in which veterinary surgeons and zoologists should be associated.—U. F. RICHARDSON.

MACGREGOR, J. J. (1941). **Depreciation in the Dairy Herd.**—*Vet. J.* **97.** 340–344.

Many valuable facts are presented in tabular form relating to the wastage due to disposal from dairy herds in the west-Midland region comprising Warwickshire, Shropshire, and Staffordshire.

In the two surveys carried out, 23·8% and 22·5% of disposals were due to sterility of all kinds ; TB. and Johne's disease grouped together were responsible for 9·7% and 4·7% respectively, and the incidence of the other diseases varied considerably. Losses due to death from disease as distinct from disposals due to disease accounted for 15% of the total loss and of these as much as 50% were associated with calving.

In addition to the above causes of financial loss, the author draws attention to that incurred by replacement. The average difference in value between purchases and sales of cows was estimated at £6 per animal. —N. S. BARRON.

GÖTZE, R. (1941). Ueber die Verlängerung der Lebensund Nutzungsdauer der Milchkühe. **[The Prolongation of the Life and Usefulness of Milch Cows].**—*Dtsch. tierärztl. Wschr.* **49.** 397–403 and 413–416.

Statistics on wastage in herds of cattle are very hard to obtain and little is known about the losses involved. Among 5,000 cattle examined at Hanover veterinary school, 765 were adjudged worthless and recommended for slaughter. The chief causes of this were surgical and internal (non-invasive) diseases (25%), diseases associated with breeding (22%), pregnancy and udder diseases (12% each), and deficient productivity, inherited defects, and old age (10%). The remainder comprising 19% included TB., parasitic diseases, metabolic diseases, and various odd conditions.

G. discusses the influence of genotypic and phenotypic factors on health and disease and remarks on the tendency to overemphasize inherited defects and the prevention, by the application of treatment, of the natural tendency for them to die out, *e.g.* some bovine families have an abnormally narrow genital tract, which if left untreated would result in fatal dystokia.

Diet is of great importance and often determines the difference between a herd's flourishing and dwindling. In some parts and in certain types of farm the animals undergo a winter starvation in essential dietary constituents and never acquire robust health but are an easy prey to infections and to parasitic and other diseases. Attempts to obtain great productivity accentuate this effect. Marrow-stem kale is mentioned as a foodstuff which has a deleterious effect when fed in excess, since it may cause anaemia.

Two types of inherited limb defects are evidently not uncommon around Hanover, *viz*, spastic paresis (straight hind-leg) and amyotrophic paresis (bowed forelimbs), and two types of foot defects occur, *viz*, "straddle claws" and "interdigital tumour", both of which predispose to foot rot. Defects like these must be bred out.

The commonest single cause of wastage in the cases examined was traumatic gastritis due to the ingestion of pieces of metal. It has been found that some animals eat carefully and discard foreign bodies whilst others ingest anything. Evidence suggests that this can be regarded as an inherited defect and therefore controllable genetically.

A warning is given against a possible tendency to

breed animals which can do well in unfavourable environments. It is much better and easier to weed out animals which do badly in a normal environment. This involves attention to hygiene and diet, and particularly to breeding practices.

The control of brucellosis and TB. is discussed. Both can be eradicated from a farm if the segregation principle is thoroughly carried out. It was found that TB. spread from a row of infected to a row of uninfected cattle housed together in a large and excellently constructed byre having a very wide central aisle and the rows of animals facing away from each other. It was, therefore, realized that infection can spread in any enclosed space of any size and that separate buildings are absolutely necessary in the segregation system. Isolation houses need not be expensively constructed as they are only needed for about three years in a self-contained herd.

G. concludes that the productive life of cows can be extended by (1) elimination of genetically unsound stock lines, (2) more careful clinical examination and care, and (3) improvements in general care and management.—J. E.

*Mejlhø, E. (1941). Den for Tiden herskende Kalvedødelighed. [**Diseases of Calves in Denmark**].—*Medlemsbl. danske Dyrlaegeforen.* p. 239. [Abst. from abst. in *Skand. VetTidskr.* **31.** 303 and 306].

P.M. examinations at the State Veterinary Laboratory showed that 90% of 89 calves examined in 1939–40, and 80% of 93 examined in the following year had died from infectious diseases. The remainder showed no obvious cause of death, but all were markedly emaciated, with the mucosa of the bowel swollen and the contents limited in volume and of watery consistency. M. suggests that death was due to undernourishment and avitaminosis, due in some part to the high milk prices, which led the farmers to deprive the calves of the milk essential to them.

Rose, V. T. (1942). **Field Experiments on Keratitis in Cattle.**—*J. Amer. vet. med. Ass.* **100.** 234–236.

R. divides true infectious keratitis as it affects cattle in western Kentucky into mild, acute, and chronic types and also describes allergic and nutritional keratitis. The cause and mode of transmission of infectious keratitis remains obscure. Since 1937 a mixed bacterin containing *Pasteurella boviseptica*, *Corynebacterium pyogenes*, streptococci, *Staphylococcus albus*, and *Staph. aureus* has been used as a preventive, a 5 ml. dose being given during the last half of April. Later three doses graded from 5 ml. up to 15 ml. and given at weekly intervals were found to confer an immunity which lasted throughout the summer. Treatment of nutritional keratitis by feeding maize, alfalfa hay, and minerals was successful.—C. V. Watkins.

Fominykh, V. N. (1939). O patologo-anatomicheskikh izmeneniyakh pri periodicheskom vospalenii glaz loshadei. [**Pathologic-Anatomic Changes in Periodic Ophthalmia of Horses**].—*Sovyet. Vet.* No. 3. pp. 78–80.

An account of the P.M. examination of two blind horses, no evidence being given that the blindness was due to periodic ophthalmia.—A. Moldawsky.

Davydov, Y. I. (1939). Miopatozy loshadi. [**Muscle Affections of the Horse**].—*Sovyet. Vet.* No. 5. 65–69.

A description of "co-ordination myopathy" and fascicular myopathy", the former consisting evidently of multiple slight muscular sprain in young horses being broken in, and the latter of fatigue myositis in older horses.—E. R. Pariser.

Stenius, P. I. (1941). **Equine Liver and Brain Disease in Finland in 1935.**—*Skand. VetTidskr.* **31.** 193–211. [In English].

This is a description of "liver and brain disease" in horses, so-called because of the salient clinical and P.M. features. S. first discusses those equine affections characterized by cerebral symptoms. Those caused by viruses include Borna disease, French encephalomyelitis (Moussu & Marchand, 1925), Berlin encephalomyelitis (Dorberstein, 1925) and the special Württemberg type (Holz, 1934), the Eastern and Western forms of encephalomyelitis found in the U.S.A., and the Russian disease (Chluszow *et al.*, 1935). The non-virus diseases discussed are botulism, Theiler's "acute staggers" (South Africa), lupin poisoning, North American "blind staggers" and alkali disease, alsike clover poisoning (Sweden and elsewhere), and red clover poisoning (U.S.S.R.).

The "liver and brain disease", which killed several hundred horses in Finland in 1935, resembles both the encephalomyelitis of the U.S.A. and Theiler's "acute staggers" of South Africa. It is non-contagious, seasonal in incidence (July-October), and carries a mortality rate of 60–90%. It attacks adult horses irrespective of their physical condition and usually, but not always, those grazing on red clover pasture. It fluctuates in incidence and distribution annually. Acute and subacute forms are seen. The former lasts 12–24 hours with the following symptoms:—normal temperature, constipation, difficulty in swallowing, conjunctivae injected and icteric, stiffness in gait with varying degrees of incoordination, and general apathy and standing with the head against a wall, interrupted by attacks of frenzy and excitement. The subacute form persists for 3–10 days with similar symptoms which are milder at the outset. Animal inoculation trials were negative; one horse and several rabbits and g. pigs were given an intracranial, intranasal, or intra-ocular injection of brain and spinal cord emulsions from animals dead of the disease, without result. The P.M. changes, both naked-eye and microscopic, are described in detail and are confined chiefly to the liver (central and peripheral necrosis), the kidney, pancreas (necrosis of the islets of Langerhans), and the central nervous system (generalized oedema).—G. B. Brook.

Csontos, J., & Sályi, G. (1939). Adatok a lovak kötőszövetes májgyulladásának előfordulásához. [**The Incidence of Interstitial Hepatitis in Horses**].—*Állatorv. Lapok.* **62.** 175–178.

The authors investigated a disease which occurred in the autumn in horses in a village exposed to heavy floods during the previous summer. It manifested itself at first as acute gastro-intestinal catarrh and developed into the condition observed in "Schweinsberg disease" [see *V. B.* **10.** 947]. The pathological changes were characterized by chronic interstitial hepatitis. Infectious anaemia, parasites, or poisonous plants could be excluded and transmission experiments failed. The horses were fed on hay of very poor quality and on a variety of vegetable marrow, which was given very cold and in large quantities. The defective condition and unsuitable composition of the fodder were held responsible. The nature of the noxious products of decomposition could not be determined.—J. Csonka.

*Dunger, R. (1941). Ueber Sommerwunden bei Militärpferden. [**Summer Sores in Army Horses (Blood Picture)**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 492].

The affected animals showed low blood haemoglobin, lowering of the albumin : globulin ratio, and

increase of the euglobulin fraction. In some cases the ascorbic acid content of the urine was abnormally low. —H. BLASCHKO.

BREED, F. (1942). **Swine Enteritis.**—*N. Amer. Vet.* **23.** 79–83.

B. emphasizes the differences between pig paratyphoid (*Salmonella suipestifer* infection) and pig pellagra (nicotinic acid deficiency). All reports so far published about the latter condition have indicated that its pathological disturbances are confined to the skin and digestive tract, while the disease is gradual in onset and preceded by loss of weight and inappetence. Pig paratyphoid may be sudden in onset, accompanied by a high temperature, and show the P.M. features of a septicaemia.—ALASTAIR N. WORDEN.

*QUEISSER, J. (1941). Das Endometrium bei zystös veränderten Ovarien des Rindes. **[The Endometrium of Cows with Cystic Ovaries].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 556].

Thirteen out of 14 animals with ovarian cysts showed an abnormal endometrium; the picture was that of a more or less advanced endometritis glandularis cystica.—H. BLASCHKO.

*JÁRMAI, K. (1940). Ueber die Osteohämochromatosis des Schweines. **[Osteohaemochromatosis in Pigs].** —*Állatorv. Lapok.* **63.** 97–99. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 101].

A description of two P.M. observations. The brown pigment deposited in bones and internal organs was haematoporphyrin. Apart from a discoloration of the teeth, there were no clinical symptoms.—H. B.

ROSE, H., Jr., & BOYER, L. B. (1941). **Thrombocytopen: a Confirmatory Report.**—*J. clin. Invest.* **20.** 81–86.

TROLAND & LEE (1938) reported that when acetone extracts of the spleen of three human beings with idiopathic thrombocytopenic purpura were inoculated into laboratory animals, a marked temporary reduction occurred in the number of platelets in the circulating blood, whereas such extracts from persons not so affected did not have this action. They proposed the name "thrombocytopen" for the substance producing this effect. The present authors corroborate these results, having tested extracts from two affected patients. —J. DUCKWORTH.

VAN ES, L., & OLNEY, J. F. (1941). **Poultry Diseases and Parasites.**—*Bull. Neb. agric. Exp. Sta.* No. 332. pp. 90.

This is a revision of Bulletin No. 290 and deals with important poultry diseases in Nebraska as well as giving advice on general hygiene, etc.—J. E.

HÜLPHERS, G., LILLEENGEN, K., & HENRICSON, T. (1941). Meddelande från jägarförbundets viltundersökning. **[Reports of Diagnostic Work on Game Animals].**—*Svensk VetTidskr.* **46.** 182–199.

By arrangement with the Swedish Game Preserves Association, 238 specimens of hares and game birds were sent to the State Veterinary Bacteriological Institute, Stockholm for diagnostic examination. The results are listed in tabular form and discussed in this article. More than half the animals were found dead; the rest had been shot and sent in on suspicion of disease. The original must be consulted for the detailed results; a variety of causes of death was encountered.

QUORTRUP, E. R., & SHILLINGER, J. E. (1941). **3,000 Wild Bird Autopsies on Western Lake Areas.**—*J. Amer. vet. med. Ass.* **99.** 382–387.

Three thousand autopsies of wild birds from lakes in western states have shown that the major causes of death are botulism (48%), mechanical injury (19%), lead poisoning (9%), pneumonia (4%), and parasitism (3%). The general features and P.M. findings of each condition are described.—D. D. OGILVIE.

CHRISTIANSON, O. O. (1941). **Experimental Lesions Produced by Cerebrosides.**—*Arch. Path.* **32.** 369–377.

An attempt was made to reproduce Gaucher's disease in rabbits by the oral or intraperitoneal administration to a small number of animals of a purified cerebroside preparation which is stated to have been free from lecithin, cephalin, and cholesterol. The total lipid and the sphingomyelin contents of the plasma of rabbits injected intraperitoneally rose rapidly, and increases in lipid content were noted also in the liver, spleen, and lymph nodes. Splenic and lymph node enlargement were noted P.M. Histological examination revealed hyperplasia of the germinal centres of some lymph nodes, and of the Malpighian bodies and of the reticulum cells of the pulp cords in the spleen: the actual changes are described as similar but less extensive than those occurring in Gaucher's disease.

[Gaucher's disease is a chronic condition which arises early in life and is characterized clinically first by progressive splenic enlargement and later by hepatic enlargement. The reticulo-endothelial cells become enormously distended with kerasin. The aetiology is unknown, but the possibility exists that it is due to some inborn error of metabolism.]—A. N. WORDEN.

I. CROSSLEY, M. L., KIENLE, R. H., VASSEL, B., & CHRISTOPHER, G. L. (1941). **The Chemistry of Infectious Diseases. I. Polarographic Study of Blood Sera in Experimental Pneumonia in Dogs.**—*J. Lab. clin. Med.* **26.** 1500–1505.

II. CROSSLEY, M. L., VASSEL, B., & CHRISTOPHER, G. L. (1941). **The Chemistry of Infectious Diseases. II. Cystine Content of the Hydrolysates of Blood Sera in Experimental Pneumonia in Dogs.**—*Ibid.* 1635–1642.

I. Polarographic studies were made on serum from normal dogs which were then injected with type I pneumococcus, and it was found that the wave height of the current-voltage curves decreased during the course of the infection and returned to normal with recovery. It is suggested that these changes may be associated with corresponding shifts in the cystine present in the serum proteins.

The polarograms of the peptone fraction of dog sera (i.e. that fraction which after alkali denaturation is not precipitable by sulphosalicylic acid) increased in wave length as well as changing their shape during infection, and returned to normal with recovery. With the increase in wave length during illness a corresponding change in nitrogen values occurred, but the fever curves did not exactly parallel the polarogram changes.

II. The cystine content of hydrolysates of dog sera after infection with type I pneumococcus, was determined by both colorimetric and polarographic methods. The colorimetric procedure gave uniformly higher values than the polarographic method, but both methods showed that the cystine content of the serum hydrolysate decreased during infection and returned to normal on recovery.

The percentage decrease in the cystine content was paralleled by the percentage fall in the total nitrogen content and this indicated that a fall in protein level occurred during infection.—F. AYLWARD.

NUTRITIONAL AND METABOLIC DISORDERS

I. SMEDLEY-MACLEAN, I., & NUNN, L. C. A. (1941). **Fat-Deficiency Disease of Rats. The Relation of the Essential Unsaturated Fatty Acids to Tumour Formation in the Albino Rat on Normal Diet.**—*Biochem. J.* **35.** 983–989. [For previous parts, see *V. B.* **11.** 46].

II. SMEDLEY-MACLEAN, I., & HUME, E. M. (1941). **Fat-Deficiency Disease of Rats. The Storage of Fat in the Fat-Starved Rat.**—*Ibid.* 990–995.

III. SMEDLEY-MACLEAN, I., & HUME, E. M. (1941). **Fat-Deficiency Disease of Rats. The Influence of Tumour Growth on the Storage of Fat and of Polyunsaturated Acids in the Fat-Starved Rat.**—*Ibid.* 996-1002.

I. Walker tumour tissue was implanted in rats on a normal diet containing fish meal and oil cake; large tumours developed in 10–14 days. The ratio of lipoid substance to fat-free dry weight in skin, carcass, and liver, when compared with corresponding values in controls, was very variable and no significant difference was noted. In tumour-bearing animals there was a marked fall in this ratio in subcutaneous tissue compared with corresponding values for normal controls. There was no difference in the carcass and liver fat ratios.

II. Rats were kept on a fat-free diet for 172–330 days and the proportions of total lipoid and arachadonic acid to fat-free dry weight was determined in the skin, liver, and carcass. In the subcutaneous tissue the proportion of total lipoid increased with the duration of fat starvation, but the proportion of arachadonic acid decreased. The amount of acid was not significantly increased when minimal amounts of methyl arachadonate were administered daily for five weeks after 197 days of fat starvation. After dosing for ten weeks, however, a definite increase in the arachadonic acid content was observed, but the changes were less apparent in the carcass. The level of arachadonic acid in the liver rose immediately and markedly when minimal doses were given for short periods. The conclusion is drawn that a plentiful supply of unsaturated fatty acid is necessary for the formation of new tissue, but not for the maintenance of the normal metabolism of the cell. The addition of choline to the diet produced no significant effect.

III. Walker tumours were implanted into rats (a) maintained for 97 days on a fat-free diet and (b) which had received for the same period linseed oil in addition to the fat-free diet. Large tumours developed in all rats on the fat-free diet and in a large proportion of those receiving linseed oil, but in two rats of the latter group small nodules formed but failed to develop further. A marked lowering in the highly unsaturated fatty acids, in the subcutaneous tissue, but not in the carcass fat, accompanied the development of the tumours. Some evidence is brought forward suggesting that clupanodonic acid is synthesized by the rat from linolenic or linoleic acid.—G. D. SHEARER.

*SUERMANN, J. (1940). Der Einfluss der Nahrung auf den Stickstoffgehalt des Ziegeharns und auf den Cholesterin- und Azetonkörpergehalt des Ziegenblutes. **[Influence of Diet on the Nitrogen Content of Goat Urine and on the Blood Cholesterin and Acetone Body Content].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 369].

Five aged goats were fed on four different diets, namely, (a) hay and oats, (b) clover and grass pasture, (c) shredded sugar beet and hay, and (d) potato flakes and hay. Examination of the urine for nitrogen content showed it to be highest in the case of diet (b), decreasing in the order (c), (a), and (d). Similarly, the cholesterin and ketone body contents of the blood varied with the diets as follows :– (a) > (b) > (c) > (d). [Detailed figures are given for all these contents, but no particulars are given in the abstract of the proportions of the rations fed.]

OYUELA, A. M. (1941). Hipocalcemia de los bovinos con particular referencia a la tetania y su tratamiento. **[Hypocalcaemia in Cattle with Special Reference to Tetany and its Treatment].**—*An. Fac. Vet., Montevideo.* **3.** 461–470.

This is a brief review of present knowledge of the subject.—MILLER WATSON.

HUGHES, E. H., & ITTNER, N. R. (1942). **The Potassium Requirement of Growing Pigs.**—*J. agric. Res.* **64.** 189–192.

Experiments are reported which demonstrate that potassium is necessary for normal growth in young pigs. Four groups, each of five young animals, were fed an adequate basal diet with varying levels of KCl, *viz*, nil, 2·25, 4·5, and 9·5 g. per 100 lb. liveweight daily, respectively. The animals not receiving any KCl became thin, emaciated, and weak, and three of them died with P.M. findings including gastric and intestinal lesions. The growth rates of the two groups receiving 4·5 and 9·5 g. of KCl were similar, and much superior to that of the group receiving only 2·25 g. per 100 lb. liveweight. The minimum requirement is therefore taken as 4·5 g. KCl (*i.e.* 2·36 g. K) per 100 lb. liveweight daily, an amount corresponding to a dietary K content of 0·15%.

—ALASTAIR N. WORDEN.

THOMAS, R. M., MYLON, E., & WINTERNITZ, M. C. (1940). **Myocardial Lesions Resulting from Dietary Deficiency.**—*Yale J. Biol. Med.* **12.** 345–360.

A study was made of the nature of the myocardial lesions induced in rats by feeding them on a diet deficient in potassium and some members of the B complex. It was found that extensive heart injury could be produced consistently when the diet was deficient not only in potassium but also in vitamin B_6. Vitamin B_1 and riboflavin did not exercise such synergistic action, and potassium deficiency alone was insufficient. The lesions were characterized by necrosis of the muscle fibres and by a marked cellular infiltration, chiefly of large mononuclear cells.

Similar lesions were induced in five young pigs. Electrocardiographic studies carried out during life showed that a progressive alteration of the conduction pattern accompanied the deficiency, there being inversion of the T waves, prolongation of the P.-R. interval, and changes characteristic of bundle branch block, incomplete A-V block, and of acute myocardial damage.

—ALASTAIR N. WORDEN.

RUSOFF, L. L. (1941). **Distribution of "Trace Elements" in the Newborn Calf as Influenced by the Nutrition of the Dam.**—*Bull. Fla agric. Exp. Sta.* No. 359. pp. 47.

The tissues and organs of three newly born calves from normal cows and of one newly born calf from a "salt-sick" mother in Florida were examined for trace elements by spectrographic methods. Of the 27 elements looked for, only 15 were detected, *viz*, zinc, aluminium, manganese, barium, lead, molybdenum, strontium, nickel, silver, boron, chromium, tin, titanium, cobalt, and vanadium. The order in which they are listed indicates the extent of occurrence in the tissues examined, Zn being found in all the tissues and the last six elements occurring only sporadically. The failure to detect arsenic, antimony, beryllium, bismuth, cadmium, caesium, lanthanum, lithium, thorium, tungsten, yttrium, and zirconium may have been due

either to the lack of sensitivity of the spectrographic method for the element concerned or to its genuine absence from the tissues.

A comparison of the distribution and concentration of these trace elements showed no significant differences between the calves of normal and "salt-sick" mothers. [The sporadic distribution of Co in the tissues is, perhaps, the most interesting observation.]—A. EDEN.

WRIGHT, W. L. (1941). **Suggestive Evidence of Trace Element Deficiency in Illinois Sheep.**—*Vet. Med.* **36.** 572–573.

In the autumn of 1940 a disease in lambs appeared in an Illinois flock characterized by a general run-down condition, emaciation, weakness and anaemia. Some lambs died and on P.M. examination showed low blood Hb and fatty infiltration of the liver, others were given a better diet, tonic treatment, and yeast without improvement. The feeding under controlled conditions of a supplement containing Fe, Cu, Co, Mg, and Mn effected a great improvement in the clinical picture and an increase in weight of an average of 0·5 lb. per day. Although further work is necessary to determine whether an actual deficiency exists, the close resemblance between the present condition and that of established Co deficiencies in other countries was suggestive of a possible Co deficiency in these lambs.—ALFRED EDEN.

CORNER, H. H. (1941). **Cobalt and Animal Disease. Treatment for Pine Disease or Vinquish.**—*Scot. Fmr.* **49.** 258–259.

A popular article on the control of pining (vinquish or daising) in sheep by Co therapy. Symptoms and aetiology of the disease are described, and methods of Co administration are discussed, which include feeding of mineral mixtures containing Co, feeding of Co-supplemented concentrates, and oral dosing with soluble Co salts. The beneficial action of crude iron oxide is attributed to the presence of Co as impurity. A suggested mode of action of Co is that it renders the Fe in the pastures (present in abundance) available to the animal, and hence further addition of Fe is considered unnecessary. [C. still maintains his view that the disease is not directly connected with worm infestation, a view contrary to that of some other workers on the disease.]
—ALFRED EDEN.

WAY, C. (1942). **Some Observations Regarding Vitamin Requirements of Thoroughbreds in Training.** —*J. Amer. vet. med. Ass.* **100.** 335–339.

The probability that multiple vitamin and mineral deficiencies are common among thoroughbreds is discussed, and two series of original clinical observations are somewhat briefly recorded.

The first observation concerns some 85 animals, including 60 horses in training, a few brood mares with foals at foot, and some barren mares. Symptoms observed included extreme nervousness, apparent irritation of the cutaneous nerve endings, anorexia, muscular paralysis, and shivering. Treatment consisted of the oral administration of a commercial vitamin-mineral supplement termed "chevinal", reinforced in some instances by intramuscular injection of a preparation containing vitamins B_1, B_6, riboflavin, and nicotinamide. The results are stated to have been satisfactory in every case.

The second observation includes the average values of sugar, Ca, and P recorded in analysis of the blood of 116 horses, mostly in training, between 1937 and 1941. These values were :– sugar 69·5 mg., Ca 8·8 mg., and P 3·5 mg. per 100 ml., but individual data are not recorded. The values for blood sugar and Ca quoted by other authors for normal horses are 85–92 mg. and 11·9–12·2 mg. per 100 ml. respectively, and W. concludes that a degree of Ca deficiency is widespread among racehorses.—ALASTAIR N. WORDEN.

I. WILLIAMS, R. R. (1942). **Vitamins in the Future.** —*Science.* **95.** 335–340.

II. WILLIAMS, R. J. (1942). **Vitamins in the Future.** —*Ibid.* 340–344.

I. A plea is made for the application on a very much wider scale than at present of knowledge concerning the "major vitamins" (A, B, riboflavin, nicotinic acid, C, and D). Such scourges as beri-beri, infantile rickets, and scurvy are still as prevalent in certain communities as they were before the discovery of their respective aetiologies and both mixed and mild deficiencies are widespread. The use of protective foods, and of carefully selected reinforced foods, is advocated.

II. The following aspects of vitamin research are discussed :– biocatalysis ; aspects of avitaminosis ; the distribution and interrelationship, *in vivo*, of different vitamins ; "anti-vitamins" ; variations in individual vitamin requirements ; and vitamins in relation to chemotherapy, cancer research and psychiatry.
—ALASTAIR N. WORDEN.

HASTINGS, C. C. (1942). **Some Vitamin Deficiencies of Cattle.**—*J. Amer. vet. Med. Ass.* **100.** 190–192.

A general discussion of the subject in which no original work is reported. It is stated that vitamin A deficiency in both store cattle and calves, and vitamin D deficiency in calves, are prevalent on farms in central Illinois due to the methods of feeding commonly used for store cattle. During November to January, many of the fattening yards are stocked with calves from range country which has been deficient in green vegetation during the late summer and autumn, and many such animals rapidly use up their low reserves of vitamin A, the rations with which they are fed being low in this vitamin as well as in D.—ALASTAIR N. WORDEN.

BARRON, N. S. (1942). **Vitamin A and its Relationship to some of the Commoner Diseases of Farm Animals.** —*Vet. Rec.* **54.** 29–37. Discussion pp. 37–39.

Estimations were made of the vitamin A contents of the livers of 105 sheep and lambs, 134 pigs, 16 cows, 29 calves, 32 fowls, and three foals. All but the last of these included material from both normal and diseased animals, and analyses were carried out also on the milk of 72 ewes. The results indicate a lowering of the vitamin A reserves in a number of conditions affecting the respiratory or alimentary systems, *e.g.* pneumonia, lamb dysentery, and parasitic enteritis, but in general there was no correlation between the vitamin A reserve and the disease process. The livers of ten tuberculous cattle contained an average of 1,296 blue units of vitamin A per gramme, *i.e.* nearly four times as much as that of the normal cattle livers examined. No such increased values were observed in tuberculous fowl livers. Analyses of foetal lamb livers indicated negligible prenatal storage of the vitamin. Ewe colostrum, which on the first day contained 11·5% of fat, was very rich in vitamin A (average 56 B.U. per gramme of fat). By the eighth day the value had fallen to about 5 B.U. per gramme of fat (average fat content 8·7 g.). The vitamin A content of the liver of new-born lambs was found to increase very rapidly indeed, and at two weeks of age the average value recorded was 330 B.U. per gramme. Foetal pig livers contained small traces of the vitamin.
—ALASTAIR N. WORDEN.

WOLBACH, S. B., & BESSEY, D. A. (1941). **Vitamin A Deficiency and the Nervous System.**—*Arch. Path.* **32.** 689–722.

From a fairly comprehensive study involving about 500 white rats and a number of g. pigs and dogs, the

authors conclude that the nervous lesions of vitamin A deficiency are due to a disproportionate growth of the central nervous system in relation to the bone which surrounds it. A considerable number of photomicrographs is included to illustrate the point that "overcrowding" of the cranial cavity and spinal canal occurs in young animals receiving an A-deficient diet. MELLANBY's finding [*V. B.* **12.** 233.] of bony overgrowth in certain regions of the cranial cavity of such animals is confirmed, but the authors consider that in the main the lesions are due to retardation of the bone growth accompanied by an approximately normal rate of growth of the central nervous system.

Certain of the lesions produced are described in detail, among them herniation of cerebral and cerebellar tissues into arachnoidal villi. These villi, which were demonstrated in normal rats, are stated to be comparable to those found in man.—ALASTAIR N. WORDEN.

WORKANY, J., & NELSON, R. C. (1942). **Congenital Malformations Induced in Rats by Maternal Nutritional Deficiency.**—*J. Nutrit.* **23.** 321–333.

In a continuation of previous studies [see *V. B.* **11.** 548.], it was shown that typical skeletal abnormalities occurred in about one-third of the offspring of two different strains of female rats which were provided with the deficient diet. No such abnormalities were present in the offspring of females receiving either a stock diet or the deficient diet supplemented by 2% of pig's liver. Reduction of the $CaCO_3$ content of the deficient diet from 3% to 1% was accompanied by a decrease in the number of affected offspring. Females which had given birth to abnormal young subsequently produced normal litters when their diet was supplemented by 2% liver.

The work of others on the relationship of faulty maternal diet to congenital malformations is briefly discussed, including some observations which have been made on farm animals.—ALASTAIR N. WORDEN.

PAPPENHEIMER, A. M. (1942). **Muscular Dystrophy in Mice on Vitamin E-Deficient Diet.**—*Amer. J. Path.* **18.** 169–181.

A study was made of the muscular and nervous tissues of 293 young mice which were born alive of mothers receiving a vitamin E deficient diet but treated with a single dose of vitamin E at the beginning of pregnancy. Some of the young mice died within a few days of birth, and the remainder were killed at periods up to 439 days, when spermatogenesis was still active among surviving males. In all, muscular lesions were encountered in 59 animals; in the youngest animals these lesions took the form of oedematous changes, accompanied sometimes by hyaline necrosis of the fibres; later, calcification and active regeneration were observed. No lesions were found in any part of the nervous system examined, or elsewhere in the body.

No clinical evidence of "flaccid paralysis" was noted, as in the case of young rats, and there were no obvious symptoms even when severe muscular lesions were present.—ALASTAIR N. WORDEN.

ANDRUS, W. DEW. (1941). **The Newer Knowledge of Vitamin K.**—*Bull. N.Y. Acad. Med.* **17.** 116–134.

A general review of vitamin K in relation to human disease problems.—A. M. COPPING.

SPITZER, E. H., COOMBES, A. I., ELVEHJEM, C. A., & WISNICKY, W. (1941). **Inactivation of Vitamin B_1 by Raw Fish.**—*Proc. Soc. exp. Biol., N.Y.* **48.** 376–379.

Polyneuritic symptoms typical of vitamin B_1 deficiency appeared in chicks receiving 25% of raw carp in their ration. If the fish was cooked the deficiency symptoms did not appear. The effects of different parts of the raw fish were studied and the entrails appeared to be more deleterious than the heads and tails or the muscle and skin. It is considered that the action of the raw fish in destroying the vitamin B_1 of the ration may be enzymic in nature since experiments *in vitro* indicated that the inactivation of the vitamin B_1 was related to eth time of contact with the raw fish.—A. M. COPPING.

EVANS, C. A., CARLSON, W. E., & GREEN, R. G. (1942). **The Pathology of Chastek Paralysis in Foxes. A Counterpart of Wernicke's Hemorrhagic Polioencephalitis of Man.**—*Amer. J. Path.* **18.** 79–91.

A detailed account is given of the pathology of Chastek paralysis, the aetiology of which has already been described [see *V. B.* **12.** 234].

On P.M. examination the liver is found to be soft and friable, and either obviously fatty or else a dark mahogany in colour. Distention of the gall bladder is usual, and icterus is observed in 10–20% of cases. Slight renal changes are sometimes found, and in about 50% of cases there are characteristic cardiac lesions which may be taken as diagnostic and which comprise enlarged myocardial cell nucleoli, focal necrosis of the fibres, and fibrous tissue proliferation.

The brain lesions are highly characteristic, and are discussed in detail. Essentially they consist of bilaterally symmetrical vascular dilatations and proliferations, the distribution of which is confined to certain nerve centres as in the case of Wernicke's disease. It is pointed out that vitamin B_1 is necessary for the normal oxidative functioning of brain tissue, and the fact that Chastek paralysis responds to B_1 therapy is regarded as suggestive.—ALASTAIR N. WORDEN.

JOLLIFFE, N. (1941). **Newer Knowledge of the Vitamin B-Complex.**—*Bull. N.Y. Acad. Med.* **17.** 195–204.

A review of recent work on vitamin B_1, riboflavin, nicotinic acid, and vitamin B_6.—A. M. COPPING.

MARTIN, G. J., & ANSBACHER, S. (1941). **Role of Para-Aminobenzoic Acid in Vitamin B-Complex Studies with Mice.**—*Proc. Soc. exp. Biol., N.Y.* **48.** 118–120.

Greying of the fur occurred within four weeks in 75% of a group of black mice receiving a diet of purified casein, cerelose, butter fat, salt mixture, and cod liver oil with daily supplements of vitamin B_1, riboflavin, vitamin B_6, nicotinic acid, choline chloride, calcium pantothenate, and inositol. If 250 μg. *p*-aminobenzoic acid were added to the diet, no greying was observed but the mice did not grow and died in 8–13 weeks. If *p*-aminobenzoic acid was given and inositol taken from the diet, alopecia developed, but if both inositol and *p*-aminobenzoic acid were removed from the diet no deficiency symptoms were seen. The development of inositol deficiency symptoms in the presence of *p*-aminobenzoic acid was thought to be due to some bactericidal or bacteriostatic action of the latter, inhibiting bacterial vitamin synthesis within the animal body.
—A. M. COPPING.

DANN, W. J., & HANDLER, P. (1941). **The Nicotinic Acid and Coenzyme Content of the Tissues of Normal and Blacktongue Dogs.**—*J. Nutrit.* **22.** 409–414.

The low values for coenzyme in the liver and muscle of dogs with blacktongue, which have been reported by other workers [see *V. B.* **10.** 286 and 456.], were confirmed by similar methods. The decreased values as compared with tissues from normal controls were not, however, as marked as those previously reported, and were of the order of 42% and 72%, respectively, of those from normal liver and muscle.
—ALASTAIR N. WORDEN.

SARRETT, H. P., & STENHOUSE, M. (1942). **Studies in Nicotinic Acid Metabolism. II. The Fate of Nicotinic Acid in Normal and Black Tongue Dogs.**—*J. Nutrit.* **23.** 23–34.

Studies on normal and blacktongue dogs showed that trigonelline and nicotinuric acid were the chief end products of nicotinic acid metabolism ; neither of these compounds was found to be utilized when administered either orally or parenterally. Trigonelline excretion was found to be an excellent index of nicotinic acid metabolism in the dog, the daily level falling very low indeed in animals on a low nicotinic acid diet, or exhibiting symptoms of blacktongue. In such cases, several 25 mg. oral doses of nicotinic acid were required before the animal excreted even part of the dose.—A. N. W.

HUGHES, E. H. (1942). **Pantothenic Acid in the Nutrition of the Pig.**—*J. agric. Res.* **64.** 185–187.

Two experiments were conducted with methods and animals similar to those previously adopted [see *V. B.* **11.** 551]. In each case, pigs receiving a basal B deficient diet supplemented by vitamins B_1, B_6, riboflavin, and nicotinic acid became inappetent, grew very slowly, developed an incoordinated gait characterized by "goose stepping", appeared emaciated and lost hair. Some passed watery faeces and blood, and those which were autopsied were found to have inflammatory lesions of the stomach and large intestine. Control animals in each experiment grew well (0·74–0·82 lb. per head daily) and remained clinically normal on the above ration supplemented by 14·7 mg. calcium pantothenate (equivalent to 6·8 mg. pantothenic acid) per 100 lb. body weight daily.—ALASTAIR N. WORDEN.

HENDERSON, L. M., MCINTIRE, J. M., WAISMAN, H. A., & ELVEHJEM, C. A. (1942). **Pantothenic Acid in the Nutrition of the Rat.**—*J. Nutrit.* **23.** 47–58.

In rats fed a synthetic ration deficient in pantothenic acid, growth was arrested after 4–6 weeks, and greying of the fur was noted at about the same time. The condition was prevented or cured by feeding high levels (above 40 mg. per day) of calcium pantothenate. The rate of growth paralleled the level of pantothenic acid intake up to 80 mg. per day.

Calcium pantothenate was found to prevent or cure the greying which resulted in rats fed on a diet of heated grain, but not that which developed when they received a copper-deficient diet. *p*-Aminobenzoic acid was without influence on greying under the experimental conditions employed.—ALASTAIR N. WORDEN.

FIGGE, F. H. J., & ATKINSON, W. B. (1941). **Relation of Water Metabolism to Porphyrin Incrustations in Pantothenic Acid-Deficient Rats.**—*Proc. Soc. exp. Biol., N.Y.* **48.** 112–114.

Young albino rats were given a diet of commercial dog food known to be lacking in pantothenic acid. The water intake of four animals allowed to drink *ad lib.* was taken as normal. Half of this amount was given to four others, 37·5% to four, and 25% to two animals. After seven days eight of the ten animals with restricted water intake developed porphyrin incrustations around the nose [see also MCELROY *et al.*—*V. B.* **12.** 352]. The greater the water restriction the sooner the incrustations appeared, but with only 25% of the normal intake the accumulation of porphyrin ceased after a short time and reappeared when more water was allowed. The animals were killed after three weeks and the Harderian glands examined under ultra-violet light. The glands were normal except in three rats in which they appeared to be abnormally small. In two of these animals there had been little or no porphyrin incrustations.—A. M. C.

MCKIBBIN, J. M., SCHAEFER, A. E., FROST, D. V., & ELVEHJEM, C. A. (1942). **Studies on Anaemia in Dogs due to Pyridoxine Deficiency.**—*J. biol. Chem.* **142.** 77–84.

Routine estimations were made of the plasma Fe and total blood Cu of five puppies and two adult dogs in which a microcytic anaemia was induced by feeding on a diet deficient in vitamin B_6. A typical anaemia, as determined by estimations of the Hb and haematocrit values, red cell count, and mean cell volume, developed in all cases within 3½–4½ months, and during this time the plasma Fe levels rose to about 300–400 mg. per 100 ml. The blood Cu levels, which were determined at less frequent intervals, tended to fall slightly during the severe stages of the disease. The values for both minerals returned to normal with remission of the anaemia following B_6 therapy. Liver extract was found to be of value in reinforcing the curative effects of vitamin B_6, administration of which was followed by an immediate regeneration of red cells, and then by a lag period.—ALASTAIR N. WORDEN.

I. LEPKOVSKY, S., KRAUSE, M. E., & DIMICK, M. K. (1942). **The Occurrence of Fits in Pyridoxine Deficient Rats.**—*Science.* **95.** 331–332.

II. DANIEL, E. P., KLINE, O. L., & TOLLE, C. D. (1942). **A Convulsive Syndrome in Young Rats Associated with Pyridoxine Deficiency.**—*J. Nutrit.* **23.** 205–216.

I. For the first time in the U.S.A. the occurrence is described of fits of an epileptiform nature in rats maintained on a pyridoxin-deficient diet, thus confirming the work of CHICK *et al.* [*V. B.* **10.** 956]. Epileptiform convulsions never occurred at under 4½ months of age, and were much more prevalent in animals of six months and over. Many convulsions were spontaneous, but others occurred following the administration of water by stomach tube, and it is tentatively suggested that a disturbed water metabolism may have been involved in their aetiology.

II. The progeny of female rats which had been used in vitamin B_1 assay experiments (and which were considered to have received an adequate diet) developed a syndrome characterized by "running fits" and by convulsions : death usually followed within 1–2 days. Similar but less severe symptoms occurred in the progeny of stock rats which had received the same diet as that of the mothers used for assay purposes as from the day after littering. The syndrome could be prevented or cured by the oral administration of crystalline vitamin B_6.—ALASTAIR N. WORDEN.

ANSBACHER, S., & LANDY, M. (1941). **Biotin and Scaly Dermatosis of the Chick.**—*Proc. Soc, exp. Biol., N.Y.* **48.** 3–5.

A diet of heated wheat middlings and yellow maize, with washed casein on which a mixture of vitamin B_1, riboflavin, nicotinic acid, pantothenic acid, and vitamin B_6 was adsorbed, and supplemented with vitamin K, was found to produce severe dermatosis in chicks. Concentrates of biotin in amounts equivalent to 1·25 μg. daily cured the lesions and promoted growth. Subcutaneous injection of the equivalent of 2·5 μg. was required by chicks in very bad condition. The crystalline methyl ester of biotin also produced cures. The application of this method as a biological test for biotin is suggested.—A. M. COPPING.

NIELSEN, E., & ELVEHJEM, C. A. (1941). **Cure of Spectacle Eye Condition in Rats with Biotin Concentrates.**—*Proc. Soc. exp. Biol., N.Y.* **48.** 349–352.

When 10% of commercial dried egg-white was added to a purified diet supplemented with vitamin B_1, riboflavin, calcium pantothenate, vitamin B_6, and vitamins A and D, spectacled eye condition [see PAVCEK

& BAUM—*V. B.* **12.** 235.] appeared in rats in about five weeks. With 5% of egg-white only two out of four rats were affected in five weeks, and with 1% none was affected in eight weeks. With no added egg-white, rats grew normally and remained healthy on the diet. Increasing the fat content or the amounts of B vitamins in the diet did not cure or prevent the appearance of the spectacled eye condition, but the administration of a biotin concentrate equivalent to 2 μg. biotin daily was effective.—A. M. COPPING.

PHYSIOLOGY

SWANSON, E. W., & TURNER, C. W. (1941). **Evidence for the Presence of Smooth Muscle Elements Surrounding the Alveoli of the Mammary Gland.**—*J. Dairy Sci.* **24.** 635–638.

Histological examination of the udder of a lactating cow showed the presence of cells beneath the secretory epithelium of the alveoli and in the interlobular spaces, which had the appearance and staining properties of smooth muscle fibres. These cells were not observed to form a continuous band around the individual alveoli but were spaced at intervals below the epithelial cells. Smooth muscle cells were also observed around the ducts; these were more numerous and were more distinct than those around the alveoli, but there was no tendency for them to form a sphincter, although the present method of examination of the tissue does not entirely exclude this possibility. The presence of smooth muscle cells associated with the alveoli is further evidence in support of the hypothesis that the expulsion of milk from the alveoli is effected, in part at least, by muscular contraction [see *V. B.* **12.** 236].—N. J. S.

ESPE, D, & CANNON, C. Y. (1942). **The Anatomy and Physiology of the Teat Sphincter.**—*J. Dairy Sci.* **25.** 155–160.

By the use of radio-opaque substances and X-rays the authors were unable to demonstrate that a negative pressure develops at the external orifice of the teat when the pressure of milking has been released, as has been reported by several workers [see *V. B.* **6.** 302; **8.** 236, and **9.** 135]. They show that in a teat sphincter which closes normally the chances of bacteria migrating to the teat cistern and into the udder are slight. It has, however, been frequently observed that soreness at the end of the teat is associated, sooner or later, with the development of mastitis. In such cases there is a tendency for the teat sphincter to remain slightly everted and to become eroded, which, according to the authors, affords greater opportunity for infection of that quarter to occur than for one which shows no erosion. Observations in two large herds suggest that damage is more likely to occur with machine milking than with hand milking. In most cases the teat orifice of the hand-milked cows appeared as a slight depression at the end of the teat. With the machine-milked cows the opening of the teat was more often raised even though erosion of the sphincter lining had not occurred. It appears, therefore, that constant suction on the end of the teat, as occurs in machine milking, is more likely than hand milking to lead to permanent eversion and subsequent erosion of that sphincter.—N. J. SCORGIE.

DOUGHERTY, R. W., & EWALT, H. P. (1941). **Semen Studies in the Bull.**—*Amer. J. vet. Res.* **2.** 419–426.

645 samples of bull semen were examined for (1) amount of ejaculate, (2) degree of motility, (3) pH concentration, (4) sperm count, and (5) tabulation of the number and kinds of abnormal spermatozoa. Seventy-five cows were artificially inseminated with the semen from seven bulls which had been examined. Little correlation was noted between the bulls' breeding efficiency and the laboratory findings. A correlation was found between pH changes in the semen in the first few hours after it had been taken and motility and viability of spermatozoa. Very motile samples usually decreased in pH more rapidly than samples with poor motility. Refrigeration and chemical inactivation which inhibit motility prevented rapid decreases in pH. Semen samples from two bulls known to be of low fertility were usually alkaline and showed a rise, rather than a fall, in pH. Seminal vesicle secretions from abattoir specimens varied in pH from 5·65–6·33. There was considerable daily and diurnal variation in the quality of semen from two bulls examined, these being more marked in samples obtained from bulls in heavy breeding use. Analyses of the ascorbic acid content of 17 samples of semen from five bulls varied from 0·97–8·08 mg. per 100 ml. of semen.—N. J. SCORGIE.

DAY, F. T. (1942). **Survival of Spermatozoa in the Genital Tract of the Mare.**—*J. agric. Sci.* **32.** 108–111.

By carrying out inseminations with approximately two billion sperms at known intervals in relation to ovulation, it was found that the sperms were capable of survival with fertilizing capacity in the genital tract of the mare up to six days. In two inseminations made seven days prior to ovulation pregnancy did not result. Inseminations made 2–24 hours after ovulation were all sterile. Ovulation was induced in one mare by injecting pregnancy urine extract when a large follicle was present in one ovary, although the mare remained anoestrous, as judged by vaginal and cervical secretions. This mare became pregnant from an insemination two days prior to the induced ovulation.—N. J. SCORGIE.

MARSHALL, F. H. A. (1942). **Exteroceptive Factors in Sexual Periodicity.**—*Biol. Rev.* **17.** 68–89.

A review article summarizing recent evidence as to the parts played by exteroceptive stimuli which alter or regulate the gonadotropic activities of the anterior pituitary. An extensive literature relevant to the subject is reviewed and discussed under the following headings :- observations on sexual periodicity in mammals and birds, experiments with light and ultra-violet irradiation, sexual exteroceptive factors controlling the sexual cycle in mammals, birds, and lower vertebrates, and the meaning of sexual display. M. concludes that in all mammals and probably in all vertebrates there is an internal endocrine sexual rhythm with alternating periods of rest and activity. This cycle is usually adjusted to external seasonal changes and with some marked exceptions, spring is the period of greatest sexual activity, but there is much specific variation and among ruminating mammals, breeding is generally in the autumn. Among tropical and subtropical animals, breeding is not nearly as restricted to definite seasons as it is elsewhere. Experiments with light and ultra-violet irradiation indicate that differences in the amount and duration of light are factors of greater importance and of more widespread application in seasonal reproduction than other factors contributing to sexual periodicity. The evidence shows that the factors in question act through the intermediation of the central nervous system and the anterior pituitary. The cycle is liable to considerable modification by exteroceptive stimuli arising from the relations between the sexes and between the mother and her offspring. Thus ovulation in various species may depend upon stimuli normally arising from the male, but which may be imitated by experimental

methods. Sexual display and courtship phenomena among various classes of animals produce stimuli which act upon the pituitary through the hypothalamus, and so effect the synchronization between the sexual processes of the male and female which is necessary for successful procreation. Whatever the exteroceptive stimulus, the anterior pituitary is the regulator of the gonadal function.—N. J. SCORGIE.

*JONIENTZ, F. (1940). Das Auftreten der ersten Brunst bei Kühen nach der Geburt und die Aussichten auf Befruchtung bei der ersten Brunst. **[The Onset of Oestrus in Cows after Parturition and the Chances of Conception].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 505].

In 55 essentially normal cows, oestrus appeared after an average of 65 days, with resulting immediate conception in only 50%. J. attributes this low percentage to the local habit of limiting clover grazing in the late summer and of feeding the animals in the byre.

EVELETH, D. F., MILLEN, T. W., & MCNUTT, S. H. (1941). **The Blood Chemistry During the Estral Cycle in the Bovine.**—*Cornell Vet.* **31.** 331–338.

The inorganic P, Ca, Mg, and glucose of the blood serum were determined in order to establish the day to day fluctuation in mature virgin heifers; the effect of the oestrous cycle on these constituents was also studied. It was found that there was a progressive decline in serum Mg from February to July. Service and pregnancy produced no significant change in the level of Mg. There was a mild hyperglycaemia at the time of oestrus and again at parturition. The removal of the ovaries in two animals did not materially alter the blood sugar level; a significant decrease in serum Ca was recorded in the spayed animals. Usually, just following a period of oestrus, there was a decided fall in serum P; this decrease appeared to be exaggerated after copulation. Oophorectomy had no effect on serum P. The authors state that in nymphomaniac cows they have frequently observed abnormally low serum P.—N. J. SCORGIE.

MATA, E. G., & CANO, A. E. (1941). Estudios de fisiologia sexual. Duración del ciclo estral en los ovinos y su aplicación en la inseminación artificial. **[Studies on Sexual Physiology. Duration of the Oestrous Cycle in Sheep and its Application in Artificial Insemination].**—*Gac. vet., B. Aires.* **3.** 67–70.

The authors studied the duration of the oestrous cycle in sheep of the Lincoln, Romney Marsh, and Lincoln × Southdown breeds. They used vasectomized rams to mark the ewes.

In 84·2% of ewes the oestrous cycle lasted 16–18 days. They found that attacks of foot and mouth disease interrupted the regularity of the cycle.

It was found possible to inseminate artificially a large percentage of a flock, however big, within a period of 20–40 days.—MILLER WATSON.

*TÖRÖK, J. (1940). **[Chemistry of Foetal Tooth Development in Cattle].**—*Thesis, Budapest.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* Aug. 15th. 403.

T. examined foetuses of three months and onwards, and found that in the tooth germs and surrounding mesenchyma the dry matter content increased gradually with the age of the foetus, accompanied by the respective Ca and P contents. In the pulp and peridental mesenchyma the dry matter and Ca content increased to a limited degree during foetal life, but the P content increased very little, and sometimes not at all.

BRODY, S., & KIBLER, H. H. (1941). **Growth and Development. With Special Reference to Domestic Animals. LII. Relation between Organ Weight and Body Weight in Growing and Mature Animals.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 328. pp. 41.

This bulletin presents an elaborate but extremely condensed study of the relationship of weights of visceral organs to weight of body. Large masses of numerical data taken from various sources are analysed and the results presented graphically in numerous charts and figures. The method of analysis consists in plotting organ weight against body weight on logarithmic paper, fitting (by the method of least squares) the relative-growth equation $Y = aX^b$ to the data, and comparing the numerical value of b of this equation relating visceral-organ weight to body weight to that relating metabolic levels to body weight. In this equation Y is organ weight or metabolic level and X is body weight.

The outstanding factual result of this analysis is that in mature animals of different species, the weights of the neuro-endocrine systems, such as the brain and pituitary, tend to increase with approximately the same fractional power as does basal metabolism. This result is in harmony with the theory that the neuro-endocrine systems, especially the brain, are limiting factors in conditioning the basal metabolic levels. The weights of the circulatory system, especially the heart and blood, tend to vary more directly with body weight than with basal metabolism, because the work performed by the heart in locomotion of the animal tends to vary directly with body weight.

The organ-body relations in growing animals vary with the stage of growth; the value of b tends to be lower for later growth in the same species than for mature animals of different species. A series of "prediction" tables, based on the fitted relative-growth equation $Y = aX^b$ is given. Knowing the body weight, the organ weights may be estimated from these tables. —N. J. SCORGIE.

BAKER, F. (1942). **Normal Rumen Microflora and Microfauna of Cattle. [Correspondence].**—*Nature, Lond.* **149.** 220–221.

Observations were made on the micro-organisms found in abattoir material and fistula samples of the rumen contents of cattle. An account is given of the normal microflora and microfauna encountered, with a photograph of the iodophile microflora.—G. D. S.

SOPEÑA, I. (1941). Determinación del número normal de plaquetas sanguíneas en algunas especies domésticas. **[The Normal Number of Blood Platelets in some Domestic Animals].**—*Rev. Fac. Agron. vet., B. Aires.* **9.** 73–99. 108. [English summary].

S. examined the blood of 100 horses and found the average number of blood platelets to be 305,384 per c.mm. Dogs had an average of 492,893, cows 806,245, sheep 1,847,880, goats 1,526,300, and swine 595,000. —MILLER WATSON.

*SONNENSCHEIN, E. (1939). Ueber die Menge der ätherlöslichen Säuren im Magen- und Darminhalt des Schafes. **[Amount of Ether-Soluble Acids in the Gastro-Intestinal Contents of Sheep].**—*Inaug. Diss., Berlin.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* Aug. 15th. (1941)].

The lower end of the small intestine and the caecum are more alkaline than the abomasum and upper part of the intestine, and the amount of ether-soluble acid was much greater in the alkaline portions, most being found in the caecum.—J. G. CARR.

*AYOUB, M. H. (1939). Untersuchungen über die Höhe des gebundenen Blutzuckers bei Pferden unter normalen und pathologischen Bedingungen. **[The Amount of Combined Sugar in the Blood of Normal and Diseased Horses].**—*Inaug. Diss., Berlin.* [Abst.

from abst. in *Berl. Münch. tierärztl. Wschr.* June 20th. 304. (1941)].

The combined sugar normally does not exceed 166 mg.%. In inflammatory diseases the amount of combined sugar in the blood is increased.—H. B.

GALVÃO, P. E., & PEREIRA, J. (1940). Quociente de oxidação do acido lático no encefalo de aves normais e em avitaminose B_1. **[Lactic Acid Oxidation Quotient of Brain of Normal and B_1 Deficient Birds].** —*Arq. Inst. biol., S. Paulo.* **11.** 139–146. [English summary].

The authors found that in B_1 deficient poultry, showing pronounced nervous symptoms, there is a fall in the lactic acid oxidation in the brain, especially noticeable in the isthmus encephali. There is no significant change in the lactic acid consumption. This results in an increase in the oxidation quotient, $\left(\frac{\text{lactic acid consumption}}{\text{lactic acid oxidation}}\right)$, from a normal of 4·6 to 6·17. The quotient in poultry lacking vitamin B_1 but showing no nervous symptoms, is found to be normal.—I. W. B.

MENESES HOYOS, J., & CARAZA PALACIOS, H. (1939). Estudio experimental de la acción del ácido ascórbico sobre el corazón. **[The Action of Ascorbic Acid on the Heart].**—*An. Inst. Biol. Mex.* **10.** 173–186. [English and French summaries].

Small concentrations of ascorbic acid increase the amplitude of the isolated turtle auricle, large concentrations (1 : 1,000 or more) produce a marked decrease. There is no great effect upon the ventricle. A reduction of the potential is seen in the electrocardiogram of the scorbutic g. pig, which returns to normal on feeding orange juice. Small doses (0·05–0·2 g.) of ascorbic acid increase the potential in man, and small and large doses will do so in rabbits. In the latter animals, no reduction of the auricular component of the electrocardiogram is seen unless doses of more than 1 g. are given.—J. G. CARR.

ROCHE, J., & MARTIN-POGGI, R. (1941). Sur les rôles de la vitamine C et de la phosphatase dans la formation de la substance osseuse au niveau des cals de fracture. **[The Role of Vitamin C and Phosphatase in the Formation of Callus after Bone Fracture].**—*C. R. Acad. Sci., Paris.* **215.** 688–670.

After fracture of the radius of g. pigs, the vitamin C content of the callus rises from 3·8 mg. % to a maximum of 20 mg. % within 10–14 days, at a stage corresponding to fibroblast development, and the value then falls. Maximum phosphatase activity, about ten times the normal, appears suddenly about 18–24 days after fracture, that is, at the beginning of ossification.

—J. G. CARR.

POISONS AND POISONING

SPUHLER, V., & SIEGFRIED, T. (1942). Ueber eine akute Bleivergiftung beim Rind. **[Acute Lead Poisoning in Cattle].**—*Schweiz. Arch. Tierheilk.* **84.** 111–115.

Five cattle were poisoned by eating some red lead which had been spilt upon the pasture by workmen. The symptoms were those of typical lead poisoning, and four animals had to be slaughtered. Lead was found in large quantities in the organs, but none in the muscles.—J. G. CARR.

KETY, S. S. (1942). **The Lead Citrate Complex Ion and its Role in the Physiology and Therapy of Lead Poisoning.**—*J. biol. Chem.* **142.** 181–192.

This is a physico-chemical account of the lead citrate complex compared with acetate, lactate, and ascorbate. From the results it is suggested that blood citrate constitutes a physiological mechanism for the removal of lead from the body and it is further suggested that the administration of citrate may constitute a safe and effective therapy in plumbism. No account is given of any biological experiments. [See also *V. B.* **12.** 245.]—G. D. SHEARER.

ANTOPOL, W., LEHR, D., CHURG, T., & SPRINZ, H. (1941). **Changes in the Urinary Tract and Other Organs after Administration of Three Sulfanilamide Derivatives.**—*Arch. Path.* **31.** 592–602.

A description is given of the pathological changes seen in albino rats after single and repeated intraperitoneal injections of the sodium salts of sulphathiazole, sulphamethylthiazole, and sulphapyridine. These changes were frequently both severe and extensive, but it should be noted that the doses used in the experiments were usually very high.

Injection of a single, large dose of sodium sulphathiazole (1·22 g. per kg. body weight, which is the lethal dose) leads to the appearance of large amounts of the free compound, in a non-crystalline form, in the renal papillae, ureters, and bladder. This drug is more soluble than either of the other two, and it is believed that its precipitation in these regions is due to its high rate of absorption and of renal excretion, its consequent high concentration in the glomerular fluid, and its subsequent precipitation as the urine is concentrated. It is added that a similar phenomenon occurs after administration of sulphadiazine. The precipitate is usually washed out within 24 hours; but if it remains after this time, part of it becomes converted into insoluble acetylated derivatives, and pronounced lesions of the kidney develop which lead to degeneration and calcification of the tubules. These extensive changes could be obtained easily by repeated daily injections of smaller doses, *e.g.* 3–5 injections of 0·5 g. per kg. body weight.

The injection of sodium sulphamethylthiazole in doses of 0·5 g. per kg. body weight (0·78 g. per kg. is lethal) leads to the formation of concretions, composed of about 30% of the acetylated derivative, in the renal papillae, pelvis, ureters, and bladder. The presence of concrements in the kidneys was invariably accompanied by severe degenerative changes in the liver. Similar renal concrements composed of acetylated derivatives could be produced by repeated administration of any of the three drugs [dose not stated].

The authors relate the tendency for concrements of acetylated derivatives to be produced, with the solubility of the drug. The less soluble it is, the slower is its rate of excretion, and the greater is the opportunity for acetylation to occur. They advise caution in the use of sulphamethylthiazole.—D. G. DAVEY.

GROSS, P., COOPER, F. B., & MORNINGSTAR, W. A. (1942). **Glomerulonephritis in Partially Nephrectomized Rats. Relation to Administration of Sulfapyridine.**—*Amer. J. Path.* **18.** 101–107.

Partially nephrectomized rats were given excessive daily doses of sulphapyridine for about ten weeks. Marked glomerular lesions developed in the rats, but since similar lesions were present in control nephrectomized animals, the sulphapyridine itself cannot be held responsible for them.—D. G. DAVEY.

THORNING, W. M., MORRILL, C. C., & BOLEY, L. E. (1942). **Phenothiazine Poisoning in Pigs.**—*Vet. Med.* **37.** 120–122.

This report of poisoning by phenothiazine in young pigs is about the sixth warning which has appeared that care is necessary in giving the drug to these animals. The drug, mixed in a corn and oats swill, was fed to 112 young pigs, the average weight of which was 20 lb. [It seems that a miscalculation of the dose was made, because each pig may have received 8 g. of the drug, which is considerably more than the usually recommended dose (3–4 g. for pigs this size.)] Symptoms of intoxication were apparent five hours after treatment, and were well developed within ten hours. They were much the same as those reported by other workers, and included incoordination of the hindquarters, posterior paralysis, and sometimes the occurrence of a semi-comatose condition; in addition, a marked opacity of the cornea developed in some animals. Two of the pigs died, but most of the others made rapid recoveries. Blood examinations of 11 pigs showed nothing of significance.—D. G. DAVEY.

SCHNITZER, R. J., SIEBERMANN, C., & BETT, H. D. (1942). **Chemical and Toxicological Studies of Phenothiazine.**—*Canad. publ. Hlth J.* **33.** 17–24.

A method is given for purifying commercial phenothiazine by precipitating the drug in the presence of a stabilizing reducing agent. Toxicity experiments indicate that white mice tolerate without symptoms a single dose of 5 g. per kg. body weight and repeated daily doses of 1·25 g. per kg. to a total of 20 g. per kg. body weight. G. pigs appeared to be more sensitive to the drug, as a repeated daily dose of 2 g. per kg. proved toxic, leading to loss of weight and loss of hair on the feet, legs, and abdomen; the skin was coloured pink as was the neighbouring fur, and baldness and colouring were also observed around the mouth. Severe anaemia was induced in two dogs each given a total dosage of 112 g. phenothiazine. Six daily doses of 5 g. followed by four daily doses of 2 g. reduced the haemoglobin from 110% and 80% to 20% and 35% respectively. After four days' rest, the treatment was continued in daily doses of 4 g. until the remaining 64 g. had been given. The lowest haemoglobin values observed during this period were 37% and 53% respectively. At the end of the experiment the weights of the dogs were unchanged. From these results it is suggested that dogs can stand a prolonged treatment with large doses of phenothiazine without apparent permanent injury.

Observations on the elimination of phenothiazine in the urine of one human being show that most of the drug is eliminated within the first 48 hours and that excretion is completed after 3–5 days.—R. ALLCROFT.

ROCHA E SILVA, M. (1940). Fotosensibilização em bovinos a "peste das queimadas", doença causada pelo "*Holocalyx glaziovii*, Taub". [**Photosensitization in Cattle caused by** *Holocalyx glaziovii*].—*Arq. Inst. biol., S. Paulo.* **11.** 461–488. [English summary].

This paper deals with a disease in cattle which occurs in September and October when, after extensive destruction of forests by burning, the only available food for cattle consists of young shoots from scrub vegetation. When the grass starts growing again in November the disease disappears. It is associated with the ingestion of a cyanogenetic leguminous plant, *H. glaziovii*, and exposure to sunlight.

The primary lesion is extensive oedema of the subcutaneous tissues. In animals with white areas of skin, the lesions are localized in those parts. There is great irritation and some degree of fever. Photophobia, lachrymation, and polypnoea are observed. After the acute stage the swellings diminish, and are succeeded by extensive necrotic lesions, especially around the ears, on the dewlap, thighs, and abdominal surface where the skin is thinnest. Death occurs most commonly at this stage. Autopsy reveals large subcutaneous haemorrhages in those regions and in the peritoneum and gastro-intestinal walls. In chronic cases, icterus is present, the bile is red and gelatinous, and there is fatty degeneration of the liver with necrosis of the centre of the lobules. Severe eye lesions are sometimes observed.

The author gives detailed case histories of cattle fed on *Holocalyx*, an aqueous extract of the plant, and on potassium cyanide in solution. In all three cases the symptoms produced were typical of the disease. When a calf was drenched with the plant extract for 31 days, and kept inside a dark byre, no symptoms appeared. It is believed that the hydrocyanic acid of the plant causes photosensitization by strengthening the photodynamic action of the phylloerythrin present in the tissues of cattle, so that this substance is rendered toxic.

G. pig experiments carried out with 30 different plants showed that *Holocalyx* was the most toxic, causing death in 5 min. when an extract was given by stomach tube in a dose of 5 ml.—ISOBEL W. BURTON.

LIVINGSTON, P. C., & WALKER, H. M. (1940). **A Study of the Effects of Liquid Mustard Gas upon the Eyes of Rabbits and of Certain Methods of Treatment.** —*Brit. J. Ophthal.* **24.** 67–97.

The eyes of 23 rabbits were exposed to the effects of liquid mustard for varying lengths of time and the resulting lesions are described, together with the results of certain methods of treatment. The immediate effects of mustard are so rapid that no local treatment can be beneficial at this stage. The interaction of mustard and the secretions of the eye causes inactivation of the mustard as such after 15 min. Irrigation with lotions that have a specific destructive effect on the mustard is not recommended, but irrigation with 2% sodium bicarbonate gave good results. Oil drops following irrigation appeared to exert a favourable effect and cod liver oil was most beneficial. Antiseptic washes such as merthiolate 1 : 10,000 were of value, especially in cases of secondary infection; addition of diffusing factor [see *V. B.* **12.** 156–159.] to the merthiolate solution appeared to aid recovery. Observations on five rabbits, four of which were saturated with ascorbic acid by intravenous injection before and after exposure to mustard, the fifth animal serving as control, showed that this treatment had a remarkable effect in preventing the spread of keratitis and the progress of lid inflammation.

A description is given of a special irrigating speculum, by the use of which the authors believe that the spread of corneal ulceration in the human eye could be arrested.—R. ALLCROFT.

—. (1940). **Discussion on Gas Injuries to the Eye.** [Speakers: WHITING, M. H., BICKERTON, R. E., PHILLIPS, T. J., NEAME, H., LYLE, T. K., WALKER, & REA, L.]—*Proc. R. Soc. Med.* **33.** 225–236.

There was general discussion on injury to the eye by mustard gas. Experiences in France in 1917 are referred to and an account is given of the nature of the eye lesions that developed, and of how they were dealt with in the military hospitals. The onset of delayed mustard gas keratitis is described, the interval between the initial exposure and apparent subsequent cure and the development of the delayed lesions being 10–14 years.

The work of LIVINGSTONE & WALKER [see preceding abst.] on rabbits is referred to.—R. BAMFORD.

THERAPEUTICS

STAPLETON, S. F. (1942). **Dilute Oxalic Acid Solution in the Control of Hemorrhage.**—*Fort Dodge bio-chem. Rev.* **13.** 24.

S. advocates the use of a sterile solution of oxalic acid (one grain in 100 ml. or about 0·06%) for controlling haemorrhage. The doses recommended range from 5 ml. in human beings and small animals to 100 ml. in large animals, and are given intravenously. Several examples are given of the successful use of this solution in human beings and small animals. No physiological explanation is attempted.—ALFRED EDEN.

KEARNS, W. M. (1942). **Testosterone Pellet Implantation in the Gelding.**—*J. Amer. vet. med. Ass.* **100.** 197–201.

Subcutaneous implantation of 525 mg. testosterone greatly improved the stamina, spirit, and coat condition of an 18-year-old racing gelding which had shown a tendency to tire rapidly. Sexual desire was also established and the gelding actually served a mare. Smaller doses of testosterone given to two other geldings produced similar results in regard to stamina and speed. Further controlled experiments are in progress. The author states that implantation of 225 mg. testosterone every two months will suffice to bring about all the desired effects without excessive stimulation. The method of implanting the pellets is described.—N. J. S.

—. (1942). **The Uses of Stilboestrol Dipropionate in Cattle Practice.**—*Vet. Rec.* **54.** 103–105.

A summarized report of a discussion, arranged for a committee of the National Veterinary Medical Association of Great Britain and Ireland, on the use of stilboestrol dipropionate in the treatment of certain well defined disorders of the ovario-uterine tract of cattle. Unanimity was expressed regarding the efficacy of stilboestrol in the treatment of anoestrus in the heifer associated with generalized hypoplasia of the genitalia. There was, however, a wide divergence of opinion as to its mode of action. It was contended by some that heifers in which stilboestrol induced heat and ovulation were animals which had just passed into the anoestrous state, or were just passing out of that phase, and that heifers which were in a true anoestrous state could only respond with a show of oestrus. Another view was that in addition to its oestrogenic action, there was a direct stimulation of the anterior pituitary resulting in ovulation. The dose of stilboestrol recommended for heifers of the larger breeds was 20 mg. and for the smaller breeds 10 mg. There was general agreement that similar doses in the treatment of anoestrus associated with ovarian hypoplasia in the cow had given satisfactory results. Similarly, in anoestrus in the cow where a corpus luteum had been detected it was agreed that stilboestrol was effective. Evidence was presented on a few cases in which the expulsion of a retained mummified foetus had followed 3–6 days after the injection of 25 mg. stilboestrol. It was stated by one observer that expulsion of retained foetal membranes and involution of the uterus had been noted in three cases following the same dosage. Treatment of pyometra with and without a corpus luteum in the ovary, giving 25 mg. intramuscularly, was reported to be very successful. The report concludes with a warning on the indiscriminate use of the oestrogen.—N. J. SCORGIE.

*ALTARA, I. (1940). Sull'azione curativa degli estratti fetali nella ninfomania delle bovine. **[Treatment of Nymphomania in Cows with Foetal Extracts].**—*Nuovo Ercol.* **45.** 289–294. [Abst. from abst. in *Jber. Vet.-Med.* **68.** 285].

A commercial extract of bovine foetus had a pronounced inhibiting action upon the genitals of rats and g. pigs. Thirty-four affected cows were used for tests; 16 were treated by irrigation of the uterus with an aqueous solution of iodine and rupture of the ovarian cysts and three of these recovered; 18 were treated by inoculation of 60 ml. of the extract 2–3 times at intervals of 4–5 days and 14 recovered. After the latter treatment, the appearance of oestrus was delayed until 30–40 days after cessation of the dosage.—J. G. CARR.

BALADAD, A. E., & GOMEZ, A. K. (1941). **Calcium Gluconate Therapy in Equine Tetanus.**—*Philipp. J. anim. Indust.* **8.** 337–340.

The authors state that the failure of antitetanic serum, given intrathecally even in large doses, to counteract the effect of advanced tetanus infection in horses can be partially reduced by secondary chemotherapeutic measures. The symptoms are actually intensified following intrathecal injection; they are not alleviated by administration of phenolized glycerin or $MgSO_4$ solution subcutaneously but the unfavourable after-effects of the intrathecal injection of the serum can be eliminated or at least shortened by means of daily administration of Ca gluconate. Some evidence is given suggesting that serum + Ca gluconate therapy reduces the mortality from tetanus, and the authors advocate this double treatment as a routine procedure. —ALFRED EDEN.

OPPERMANN, M. (1942). Sexocretin bei der Bekämpfung der Anaphrodisie der Schafe. **[Treatment of Anaphrodisia in Sheep by Sexocretin (Synthetic di (*p*-Oxyphenyl) Hexene)].**—*Tierärztl. Rdsch.* **48.** 60–62.

A herd of 47 sheep, not in oestrus, received an injection of 2·5 ml. (= 2·5 mg.) of sexocretin (Merck); 19 came into oestrus within 1–7 days. Following a second injection, another 14 came into oestrus and a further nine after a third injection. Smaller doses were less effective.—J. M. ROBSON.

—. (1942). **Economy in the Use of Bactericides.**—*Brit. med. J.* April 11th. 475–476.

Present supplies of materials used as bactericides are restricted in the United Kingdom and every economy should be effected. It is necessary to use only those materials most readily available and to reduce the total consumption. In many cases large quantities of disinfectants are used under conditions in which they are not likely to be effective. Efficient mechanical cleansing of infected material is essential if subsequent treatment with a disinfectant is to be effective. Sterilization by heat should be used whenever possible. There is no reason to fear any shortage of disinfectants if the more highly purified ones are not used for purposes for which the cruder materials would suffice and the coal-tar disinfectants are replaced whenever possible by the more readily available materials such as formaldehyde, hypochlorites, and chlorinated lime.

The Therapeutic Requirements Committee of the Medical Research Council gives a list of recommendations for the treatment of contaminated material and stresses the efficiency and reliability of heat treatment as compared with bactericides.—G. D. SHEARER.

ZONDEK, B. (1942). **Chemotherapeutical Use of Halogenized Phenols as External Disinfectants.**—*Nature, Lond.* **149.** 334–335.

It is pointed out that the reason why horse urine remains for months without decomposing is due to the presence of phenol bodies. From investigations carried

out it is apparent that the external application of halogenized phenols effected internal disinfection. Halogenized xylenol, which constitutes the basic principle of dettol, was found to be the most suitable for study, and for this purpose *p*-chloro-xylenol was used. The disinfective power of this compound (CX) was found to be 25–30 times as strong as that of phenol *in vitro*. After the administration of CX percutaneously and parenterally in small doses the urine excreted remains sterile and in this respect CX is seven times as active as sulphanilamide and six times as active as sulphapyridine. The total elimination of free CX is greater in alkaline urine than in acid urine. It is thus advisable to give sodium bicarbonate and sodium lactate before treatment with CX. It is strongly emphasized that treatment with halogenized phenols is harmless in man and causes no secondary effects.—G. D. SHEARER.

DURRIEU, E. (1941). Aplicación de una nueva serie de antisépticos en la medicina veterinaria. **[A New Series of Antiseptics for Use in Veterinary Medicine].** —*Rev. Med. vet., B. Aires.* **23.** 298–318.

An account of certain antiseptics, the nature of which is not disclosed.—MILLER WATSON.

MINGOJA, Q. (1940). Estrutura quimica e atividade antibacteriana. **[Chemical Structure and Anti-Bacterial Activity].**—*Arq. Inst. biol., S. Paulo.* **11.** 269–282. [German summary].

This article deals with the basic principles underlying the formation of antibacterial compounds from sulphanilamide, and with the variations in chemotherapeutic activity caused by varying the nature and position in the molecule of the substituent group or groups.—ISOBEL W. BURTON.

ARMSTRONG, A. R., & RAE, M. V. (1941). **Chemotherapy and Experimental Gas Gangrene.**—*Canad. med. Ass. J.* **45.** 116–118.

Using sulphanilamide and 17 other drugs in concentrations of 1, 5, 10, and 100 mg.% in Hartley's broth and an inoculum of *Clostridium welchii* prepared in a special manner, it was found that cultures of *Cl. welchii* were definitely inhibited by *p*-tolylamidine hydrochloride, and were slightly inhibited by sulphanilamide, sulphamethylthiazol, sulphapyridine, and prontosil. Oral administration of five of these drugs failed to control gas gangrene induced in g. pigs by the injection of calcium chloride and toxin-free cultures of *Cl. welchii*. 200 mg. of sulphanilamide, sulphathiazole, sulphapyridine, or *p*-tolylamidine hydrochloride suspended in 0·2% agar and injected into the tissues at the site of infection were effective in curtailing the spread of the infection and reducing mortality. The difference is discussed between the results these authors obtained in the oral administration of these drugs and the favourable findings of other workers using the same treatment in actual clinical cases.—J. L. BYRNE.

NITTI, F., & BLOCH, F. (1940). Chimiothérapie et sérothérapie dans les infections expérimentales provoquées par le *Bacillus perfringens*. **[Chemotherapy and Serum Treatment of Experimental *Clostridium welchii* Infection].**—*C. R. Soc. Biol. Paris.* **134.** 199–200.

A six-hour broth culture of *Cl. welchii* was introduced into deep thigh wounds on a gauze compress which was allowed to remain *in situ* for 24 hours. Control g. pigs which received no curative treatment died in 2–3 days. Powdered *p*-aminophenylsulphamide was placed in the lesion of several g. pigs so prepared, before closure of the wound. There was marked spreading inflammation, and extensive sloughing. Another group was treated with *Cl. welchii* antiserum. Some g. pigs died (several days later than the controls), while others survived, and large sloughs formed. G. pigs treated with both *p*-aminophenylsulphamide and antiserum all survived and their wounds healed by first intention.

The authors conclude that where gangrene has set in, it is necessary to apply sulphonamide therapy to act on the microbial factor, and serum therapy to counteract the myolytic and haemolytic factors. Sulphonamide therapy alone is sufficient if given before the bacilli have had time to generate toxins.—ISOBEL W. BURTON.

NETER, E. (1942). **An in vitro Study on the Synergistic Action of Sulfamido Compounds and Azochloramid Upon Various Pathogenic Microorganisms.**—*J. Pharmacol.* **74.** 52–60.

N. has demonstrated a synergistic action between azochloramid (N, N′-dichloroazodicarboxamidine) and sulphanilamide-like compounds (sulphanilamide, sulphapyridine, sulphathiazole, and sulphadiazine) in their effect on the growth *in vitro* of various bacteria. The organisms used were haemolytic streptococci of groups A and D, pneumococcus type I, and *Staphylococcus aureus haemolyticus*.—D. G. DAVEY.

ROSE, H. M., & FOX, C. L., Jr. (1942). **A Quantitative Analysis of Sulfonamide Bacteriostasis.**—*Science.* **95.** 412–413.

Observations were made on the effects of sulphanilamide, sulphaguanidine, sulphapyridine, sulphathiazole, and sulphadiazine on the growth of *Bacterium coli* in culture media. It is shown that, with inocula ranging from 25–25,000 organisms per ml., the same absolute amount of *p*-aminobenzoic acid is required to abolish the bacteriostatic action of the minimum effective concentration of each drug. Evidence is also given that a definite number of all divisions occurs in the presence of any effective drug concentration, whatever the size of the inoculum implanted in the culture medium. This is taken to explain why no apparent bacteriostasis may be observed when large inocula are employed, since even a small number of all divisions will bring such cultures into the range of visible turbidity.—D. G. DAVEY.

SMITH, M. I., EMMART, E. W., & WESTFALL, B. B. (1942). **The Action of Certain Sulfonamides, Sulfones and Related Phosphorus Compounds in Experimental Tuberculosis.**—*J. Pharmacol.* **74.** 163–174.

A series of sulphonamides, sulphones, and certain related phosphorus compounds were examined for tuberculostatic action *in vitro*. Good inhibition in decreasing order of magnitude was obtained with diaminodiphenylsulphone, diaminodiphenylsulphoxide, sulphathiazole diaminodiphenylsulphide, sulphadiazine, phosphanilic acid, and promin. Therapeutic tests in experimental animals (g. pigs injected with either of two strains of human tubercle bacilli and rabbits infected with a bovine strain) showed a favourable effect both as regards survival time and retardation of the progress of the disease with diaminodiphenylsulphone, promin, and sulphadiazine [see also WINSHAW *et al.*—*V. B.* **12.** 430.]—J. M. ROBSON.

BORNSTEIN, S., & STRAUSS, L. (1941). **Selective Action of Sulphanilyl-Guanidine on Different Salmonella Types and its Practical Importance.**—*Proc. Soc. exp. Biol., N.Y.* **47.** 112–115.

The effect of sulphanilylguanidine was studied by means of the agar strip method on 87 salmonella types, 15 strains of *Bacterium coli*, two of *Bact. flexneri*, one of *Bact. sonnei*, one of *Bact. shigae*, and one of *Aerobacter*. Of all the salmonella organisms tested only *S. typhi*, *S. paratyphi A* and *S. cholerae-suis* showed any marked degree of inhibition; very slight inhibitory

action was noted on *S. paratyphi C*, *S. abortus-equi*, *S. sendai*, *S. gallinarum*, *S. muenster*, and *S. newington*. *Aerobacter* was resistant and all four dysentery strains were strongly inhibited, but the 15 strains of *Bact. coli* showed individual differences. Test tube experiments confirmed the results obtained by the agar strip method except that the individual differences between the *Bact. coli* strains were of minor degree. *In vivo* experiments on mice infected with *S. cholerae-suis*, *S. typhi-murium* and *S. enteritidis* showed that administration of sulphanilylguanidine prevented the death of animals infected with *S. cholerae-suis*, although all the animals died when treatment was discontinued. Both treated and untreated mice infected with *S. enteritidis* died within 3–8 days, but of the mice infected with *S. typhi-murium* only one out of four non-treated animals died, while all four treated with the drug died within 7–11 days. It was concluded that sulphanilylguanidine has a marked bacteriostatic action on *Bact. coli*, *S. typhi*, *S. paratyphi*, and *S. cholerae-suis*, but is practically without effect on other salmonella types. The results also indicate that sulphanilylguanidine treatment of infections with salmonellas other than the susceptible types may be harmful, as the selective action of the drug may allow the pathogenic organisms to flourish while the *coli flora* is suppressed.—R. ALLCROFT.

BRYAN, A. H. (1942). **Sulfaguanidine (Sulfanilyl Guanidine Monohydrate) in Enteric Infections of the Dog and Cat.**—*Lederle vet. Bull.* **11.** 5–8.

B. gives a short account of his clinical experiences with sulphaguanidine in cats and dogs. He has used it successfully in the treatment of diarrhoea, due to salmonella food poisoning and to secondary infections following distemper. He also records cure of otitis in a dog.—D. G. DAVEY.

PRAT, P. L. A. (1941). Las sulfapiridinas en los processos pulmonares de los ovinos. **[Use of Sulphapyridine in Lung Diseases of Sheep].**—*Gac. vet., B. Aires.* **3.** 135–136.

An account of the successful treatment by sulphapyridine of broncho-pneumonia, caused by a pneumococcus, in sheep.—MILLER WATSON.

MÜLLER, O. (1942). Irgamid, ein neues Sulfanilamidpräparat zur Behandlung bakterieller Erkrankungen des Klein- und Grosstieres. **[Irgamid, a New Sulphonamide Preparation for the Treatment of Bacterial Diseases of Small and Large Animals].**—*Schweiz. Arch. Tierheilk.* **84.** 13–24.

Irgamid is the N_1-dimethylacrodyl derivative of sulphanilamide and is a white tasteless powder; the 20% solution of the sodium salt is only feebly alkaline (pH 8·3) and is thus suitable for parenteral administration. It has a low toxicity and is, it appears, highly effective against streptococci and pneumococci. Large doses have been injected into various animals without ill effects. Preliminary data on the effects of this new compound in the treatment of various septic conditions in animals are given and these suggest that the drug merits further investigation.—J. M. ROBSON.

GREEN, H. N., & BIELSCHOWSKY, F. (1942). **The Mode of Action of Sulphanilamide. II. The Antisulphanilamide and Other Anti-Bacteriostatic Factors in Bacterial Extracts. III. The Relation of Chemical Structure to the Bacteriostatic Action of Aromatic Sulphur, Selenium and Tellurium Compounds.**—*Brit. J. exp. Path.* **23.** 1–13 and 13–26. [For part I, see *V. B.* **11.** 396].

II. Evidence is given that the ether-soluble antisulphanilamide factor obtained from bacteria is identical with, or closely related to, *p*-aminobenzoic acid. The ether-insoluble fractions of crude bacterial extracts contain a factor which has a nonspecific anti-sulphanilamide action due to its growth-stimulating action on bacteria. They probably also contain a specific anti-sulphanilamide factor. These ether-insoluble fractions antagonize certain other bacteriostatic substances, against which the ether-soluble bacterial anti-sulphanilamide factor and *p*-aminobenzoic acid are ineffective.

III. On the basis of *in vitro* findings with a number of aromatic sulphur compounds, it is suggested that the active principle of compounds with a sulphanilamide-like action is the $NH_2\langle__\rangle$—S radical. Compounds containing an oxidized *p*-amino group are not antagonized by *p*-aminobenzoic acid. Compounds containing a *p*-amino group and bivalent sulphur are antagonized by *p*-aminobenzoic acid, but after oxidation of their amino group, *p*-aminobenzoic acid is ineffective. The findings suggest that the more effectively a compound blocks the bacterial enzyme whose natural substrate is *p*-aminobenzoic acid, the greater is its bacteriostatic action. The sensitivity of bacteria to sulphanilamide is probably determined by the rate at which *p*-aminobenzoic acid is synthesized in the bacterial cell and/or is released into the surrounding medium. Tests with several aromatic selenium and tellurium compounds suggest that the substitution of sulphur by selenium or tellurium results in compounds whose bacteriostatic properties are related to those of the corresponding sulphur compounds.—J. M. ROBSON.

HAWKING, F. (1942). **Sulphonamide Compounds in Faeces.**—*Lancet.* **242.** 290–291.

A study was made of the concentrations of various sulphonamides in the faeces of cats, mice, and men after oral administration. The faeces of cats often contained high concentrations of all the compounds examined. In mice, sulphathiazole seemed to be more effective than sulphaguanidine in diminishing the number of bacteria present in the faeces, but the doses required to demonstrate this were toxic. In the faeces of normal people, sulphaguanidine was excreted in high concentrations while sulphapyridine, sulphathiazole, sulphadiazine, and sulphanilylbenzamide were found only in fairly low concentrations. These results support the view that sulphaguanidine will prove suitable for the treatment of bacillary dysentery.—J. M. ROBSON.

GELORMINI, N. (1941). El bromhidrato de arecolina como eliminador del Echinococcus granulosus. **[Arecoline Hydrobromide as an Anthelmintic against *E. granulosus* in Dogs].**—*Inst. Parasit. Fac. Agron. Vet., Univ. B. Aires.* **2.** No. 1. 3–10.

G. used arecoline hydrobromide as an anthelmintic in dogs artificially infested with *E. granulosus*. He found it efficient in doses of 4 mg. per kg. body weight, and P.M. examination failed to reveal the presence of the cestodes. He advises giving only liquid food for 24 hours before treatment and administering the drug *per os*. When the drug does not act he considers it advisable to repeat the dose in one hour.—MILLER WATSON.

MANSON-BAHR, P. (1940). **Phenothiazine as an Anthelmintic in Threadworm and Roundworm Infections.**—*Lancet.* **239.** 808–809.

The results of these trials of phenothiazine as an anthelmintic in human beings indicate that it has a marked action against *Enterobius vermicularis*, an uncertain action against *Ascaris lumbricoides*, and no action against *Ancylostoma duodenale* and *Trichuris trichiura*. —D. G. DAVEY.

PETERS, B. G., & LEIPER, J. W. G. (1941). **Single *versus* Multiple Doses of Phenothiazine in Lambs.**—*J. Helminth.* **19.** 63–70.

The authors previously [*V. B.* **12.** 59 and 177.]

found phenothiazine to be relatively ineffective as an anthelmintic for sheep. They now report experiments in which a single dose of 40 g. (given to four sheep) was very effective against *Haemonchus*, *Trichostrongylus* spp., and *Chabertia*, and less effective, but still good, against *Ostertagia*, *Nematodirus*, and, what is very unusual, against *Strongyloides*. The single dose of 40 g. appeared to be better than the same amount divided and administered over a period of ten days (15 g. on one day, and then five lots of 5 g. at two-day intervals). Too few *Bunostomum* and *Oesophagostomum* were present in the experimental animals to warrant a definite statement of effect on them.—D. G. DAVEY.

LEIPER, J. W. G., & PETERS, B. G. (1941). **The Effect of Phenothiazine on the Weights of Worm-Free Sheep and Goats.**—*J. Helminth.* **19.** 71–74.

Three goats and six sheep, which had been reared indoors and were known to be free from worms, were each treated with phenothiazine as follows :– 15 g. were given in the first dose ; seven weeks later a second dose of 5 g. was given, and this was followed by two more doses of 5 g. at fortnightly intervals. The weights of these animals were compared with those of a similar number of undosed controls for a period commencing one week before the time of administration of the first dose and extending over 15 weeks. No significant difference could be detected between the weight curves of the two groups. It is therefore concluded that increase in weight following anthelmintic treatment is due to removal of worms and that consequently weights can validly be used as a criterion of anthelmintic efficacy.—D. G. DAVEY.

ANDREWS, J. C., & CORNATZER, W. E. (1942). **Some Properties of Ficin.**—*J. Pharmacol.* **74.** 129–133.

Ficin is a proteolytic enzyme contained in the milky sap of the fig. It has the unusual property of being able to digest living tissue, and will attack the cuticle of living intestinal helminths, producing a marked blistered appearance [see also FAUST & THOMEN —*V. B.* **12.** 177]. The authors, using a partially purified enzyme, showed that the effect on the cuticle of *Ascaris* still takes place when the worm is ligatured in such a way as to prevent the solution entering its gut. By testing the effect of faecal extracts on 2% gelatin solution, and determining the percentage rise in free amino N, they have also demonstrated that some ficin passes right through the alimentary canal after oral administration. This explains why it is able to kill worms as low in the alimentary canal as *Trichuris*. [Natives in tropical America have used the fresh latex of figs for centuries for the removal of helminths, particularly *Trichuris*.]—D. G. DAVEY.

CARMICHAEL, J. (1942). **4 : 4′ Diamidino Diphenyl Ether (M & B 736) in Canine Babesiasis.**—*Vet. Rec.* **54.** 158.

C. confirms the observations of LOURIE & YORKE [*V. B.* **11.** 58.] that 4 : 4′-diamidino-diphenylether is effective against *B. canis* infection in dogs. The dose used is 10 mg. per kg. body weight. The drug is dissolved in distilled water in the proportion of 10 mg. to 0·5 ml. (the solution is stable), and the appropriate quantity of solution is injected subcutaneously. Clinical improvement is usually rapid, but it is stated that in cases where anaemia is very marked haematinic treatment for a few days following the specific therapy is indicated. No undesirable toxic effects of the drug have been encountered.—D. G. DAVEY.

HAWKING, F., & SMILES, J. (1941). **The Distribution of 4 : 4′-Diamidino Stilbene in Trypanosomes and Mice as Shown by Fluorescence.**—*Ann. trop. Med. Parasit.* **35.** 45–52.

Use is made of the fact that 4 : 4′-diamidinostilbene fluoresces when exposed to ultra-violet light, to demonstrate its distribution in trypanosomes (*T. equiperdum*) and in mice. The trypanosomes were examined 15 min. after the host mouse had been injected with the drug, and it was found that the drug was then concentrated in the blepharoplast and in granules in the cytoplasm. Following its subcutaneous injection into mice, the drug collects in the liver and kidneys and possibly in the small intestine and skin. It is excreted in the urine, but not apparently in the bile.

A brief account is also given of the distribution in mice, following subcutaneous injection, of some other fluorescent substances such as acriflavine, eosin, and palmatine.—D. G. DAVEY.

CULBERTSON, J. T. (1941). **Specific Chemotherapy of Giardia Infections.**—*J. Lab. clin. Med.* **26.** 1465–1470.

Two cases of human *Giardia* infection cured by a course of treatment with atebrin are described, two 0·1 g. tablets being given daily for five days. Administration of the drug to rats and mice experimentally infected with various species of *Giardia* resulted in complete elimination of the parasites in every animal. Acriflavine, used in the same dose as atebrin, was also found to be effective for the cure of *Giardia* infection in rats. The two drugs appeared to have little action in infections with *Cheilomastix*, *Trichomonas*, or *Entamoeba*. —U. F. RICHARDSON.

YAKIMOV, V. L., GUSEV, V. F., & PELEVIN, V. K. (1939). O lechenii nuttallioza loshadeĭ khimioterapevticheskimi preparatami. **[Chemotherapy of *Babesia equi* Infection].**—*Sovyet. Vet.* No. 3. pp. 75–77.

Piroplasmin (the Soviet equivalent for acaprin) was tested on 12, and flavacridin (equivalent for acriflavine) on nine horses experimentally infected with *B. equi*. Piroplasmin even by repeated injection did not clear *B. equi* from the peripheral circulation. The authors criticize the publications of KIKUTH (1935), who used acaprin and of GANNUSHKIN (1937) who used piroplasmin, both having recorded successful treatment of *B. equi* infection. Possibly the natural infection with *B. equi* is less virulent than the experimental one. On the other hand, old horses were used for this experiment, which might have influenced the results obtained.

Better results were given by flavacridin (eight cases) and trypaflavine (one case) in a dosage of 1–1·5 g. It was not always possible, however, to free the peripheral circulation completely even by repeated injection or by double dosage.

Neither flavacridin nor trypaflavine given 5–6 days after infection prevented the development of infection. —A. MOLDAWSKY.

FILKOV, N. S. (1938). Opyty primeneniya hipertermii pri terapii eksperimental'nogo entsefalomielita. **[Treatment by Hyperthermy of Experimental Equine Encephalomyelitis].** — *Trud. vet. Fak. Vologda. sel'skokhoz. Inst.* **2.** 22–77.

Various experiments were conducted to study the action of artificial hyperthermy produced by α-dinitrophenol and by killed cultures of *Chromobacterium prodigiosum*, and it was found that subcutaneous and intravenous inoculation of these preparations produced a rise of temperature in rabbits and horses which lasted 3–7 hours. Certain beneficial effects were noticed in rabbits artificially infected with E.E., such as prolongation of the incubation period and course of the disease. Hyperthermy is, in F.'s opinion, more effective than treatment with urotropine. [There is no evidence that urotropine has any specific action on infected tissue of the central nervous system. It has been advocated frequently for diseases affecting the c.n.s., but on the

false assumption that it breaks down locally in the tissues to formaldehyde. It only does so in an acid medium. Its use, therefore, for kidney infection is not applicable to c.n.s. infection.—Ed.] Preventive hyperthermy did not avert an outbreak of E.E. in intracerebrally infected rabbits. F. claims that in many cases hyperthermy artificially produced on the 4–7th day after intramuscular inoculation of the virus prevents infection. [This claim is not very convincing as intramuscular infection of rabbits with E.E. virus often fails.] Artificial hyperthermy was used in four naturally infected horses. Two were treated with an intravenous injection of 5 ml. of *Ch. prodigiosum* containing five thousand million bacilli per ml., and two with a 2% solution of α-dinitrophenol. All but one animal, treated with α-dinitrophenol, recovered. The therapeutic effect of hyperthermy is, in F.'s opinion, due to increase of metabolism and to lowering of the impermeability of the blood-brain barrier, which enables penetration of antibodies from the blood into the brain.—A. MOLDAWSKY.

PUBLIC HEALTH

FEEMSTER, R. F. (1941). **Milk-Borne Disease in Massachusetts 1933-1940.**—*Amer. J. publ. Hlth.* **31.** 1169–1173.

Over 90% of milk sold in Massachusetts is pasteurized and an increasing number of bacteriological examinations are being made to ensure the safety of the milk supplied.

During the last five years, only four outbreaks of milk-borne disease have occurred, in none of which there were any fatalities. In all cases the milk had not been pasteurized. No case of diphtheria has been traced to milk since 1925 and no case of typhoid fever since 1932. Septic sore throat and undulant fever are the only diseases which have been traceable to milk during recent years.

In the main, the demand for pasteurization has arisen from the public following upon the outbreaks of milk-borne septic sore throat which were prevalent in the years immediately following 1911. In 1928 an outbreak, involving 1,000 cases with 48 deaths, led to regulations requiring all milk sold to be either pasteurized or produced from certified herds.

From 1911 to 1915 there was an average of nine milk-borne outbreaks per year, but these have now decreased to less than one per year.—H. E. BYWATER.

I. PHELPS, E. B., & BUCHBINDER, L. (1941). **Studies on Microorganisms in Simulated Room Environments. I. A Study of the Performance of the Wells Air Centrifuge and of the Settling Rates of Bacteria through the Air.**—*J. Bact.* **42.** 321–344.

II. BUCHBINDER, L., & PHELPS, E. B. (1941). **Studies on Microorganisms in Simulated Room Environments. II. The Survival Rates of Streptococci in the Dark.**—*Ibid.* 345–351.

III. BUCHBINDER, L., SOLOWEY, M., & PHELPS, E. B. (1941). **Studies on Microorganisms in Simulated Room Environments. III. The Survival Rates of Streptococci in the Presence of Natural, Daylight and Sunlight, and Artificial Illumination.**—*Ibid.* 353–366.

I. The mechanics and constants of the Wells air centrifuge are described; the purpose of the centrifuge is to separate bacteria from a sample of air passed through it and deposit them on a surface of nutrient agar, upon which they are subsequently grown and counted in the usual manner. The agar is carried on the vertical walls of a cylindrical glass bottle which revolves at 4-5 thousand r.p.m. A theory of the action of the centrifuge is described giving certain equations, which express the upper limit of its efficiency and percentage recovery, in terms of normal settling velocities of particles and of speed and dimensional constants of the machine. An experimental technique is described to test the validity of the theory. Living bacteria were sprayed into a closed chamber, approximately an 8 ft. cube, from which samples could be taken at frequent intervals by means of a Wells air centrifuge let into the chamber, and on the floor of which prepared petri dishes could be exposed and removed as desired. In order to simulate coughing or sneezing an atomizer was used for spraying in bacteria. The rate of settling upon the floor appeared to decrease geometrically and could be expressed as the height of the chamber × the rate of removal expressed as percentage of remainder. Comparison of recoveries by centrifuge and by settling gave rather confused results, but by using inert chemical substances such as uranine and phosphate for which colorimetric tests could be used as a check, more complete and satisfactory analysis of the data was possible. The particles produced were of such a size that the proportion theoretically recoverable in the centrifuge could not exceed 69% of the number ultimately capable of settling. Actual recoveries were less than this.

II. Three strains of streptococci (group A, group B haemolytic, and α-haemolytic) were, in turn, sprayed into the chamber described in I, and allowed to settle on to filter paper covering the bottom of petri dishes. The plates were then stored in the dark at room temperature and flooded with blood agar at various intervals. The times for "50% survival" of the organisms were as follows: group A 13 days, group B five days, and α-haemolytic 1·1 days.

III. The same technique was employed, but after removal from the chamber, petri dishes were placed in various types of light. Direct sunlight, and daylight, even on cloudy days and after passing through two layers of glass, were potent lethal agents for streptococci. The killing action of sunlight and daylight was approximately proportional to their respective intensities. It is probable that the effect is due mainly to the blue region of the visible spectrum. The lethal action per foot-candle increases as the proportion of blue light increases. Fifty minutes' exposure to daylight destroyed 50% of the α-haemolytic strain; the group B strain was somewhat less susceptible and the group A much less so. The group A strain was a long-chained variety and the others of the short-chained type. As only one colony is produced by a single chain, however many viable bacilli it may contain, this was thought to explain the much greater apparent resistance of the group A strain.

[The group B strain used in this study was of human origin and different results might have been obtained with a bovine strain.]—JOHN FRANCIS.

TECHNIQUE AND APPARATUS

ZIMMERMANN, W. (1940). Beitrag zum fluorescenzmikroskopischen Nachweis von Bakterien. [**Fluorescence Microscopical Demonstration of Bacteria**].—*Z. Hyg. InfektKr.* **122.** 684–691.

Z. stained slides to be examined by fluorescence microscopy (fl. mic.) by a technique consisting essentially of a combination of Hagemann's and Herrmann's methods, smears being stained with hot 0·1% phenol-

auramine solution and differentiated with acid alcohol; they were counterstained with a dilute mixture of methylene blue in acetic acid and crystal violet. For non-acid-fast organisms smears were differentiated by the use of water or alcohol. Fl. mic. by this method is only of value for the demonstration of certain yeasts, moulds, spores, and, most important of all, of acid-fast organisms.

Z. considers that fl. mic. is easier and is more rapidly carried out than ordinary microscopic examination of smears stained by the Ziehl-Neelsen method, and it reveals on the average 19% more positive cases of TB.

As, however, by fl. mic. tubercle bacilli cannot be differentiated with certainty from other acid-fast organisms, all cases revealed as positive by this method should be retested by the Ziehl-Neelsen technique. The net gain in time is, therefore, only small, but the increased accuracy of diagnosis makes this procedure worth while.—M. LANDAU.

GREENBERG, L. (1941). **Single Colony Isolation of Anaerobes.**—*Canad. publ. Hlth J.* **32.** 84–85 and 314–316.

G. comments briefly on some of the difficulties encountered in obtaining pure cultures of anaerobes. He then gives, in detail, the composition of the medium and the inoculation technique, the use of which has proved successful in the single colony isolation of the majority of the common anaerobes. A method for handling contaminated material containing both aerobes and anaerobes is outlined with the claim that it is both efficient and quick.—J. L. BYRNE.

STECK, W. (1941). Die gleichzeitige Bestimmung des Blutkörperchensedimentes und der Sedimentierungsgeschwindigkeit beim Pferd. [**Simultaneous Determination of Blood Corpuscle Sediment and Sedimentation Rate in the Horse**].—*Schweiz. Arch. Tierheilk.* **83.** 281–287.

A simple method is given for simultaneous determinations of the sedimentation rate and the amount of red blood cells. When the method was used for the blood of a horse from an area where equine infectious anaemia was known, the sedimentation rate was found to be 30–50 mm. in 15 min., indicative of high-grade anaemia (the normal rate was 6–40 mm. by the same method). The diagnosis of E.I.A. was confirmed P.M. —F. AYLWARD.

*SCHLEY, H. (1940). Ein Beitrag zur Kenntnis der Senkungsgeschwindigkeit der roten Blutkörperchen des Pferdes. [**Research on Red Blood Cell Sedimentation in the Horse**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Berl. Munch. tierärztl. Wschr.* June 20th. 305. (1941)].

Shaking increases the rate of sedimentation. Determinations of the sedimentation rate for diagnostic purposes should therefore be carried out on the spot. —H. BLASCHKO.

*STÜBINGER, K. H. (1939). Der Einfluss der Fütterung auf die Senkungsgeschwindigkeit der roten Blutkörperchen bei Pferden. [**Influence of Feeding on the Red Blood Cell Sedimentation Rate of Horses**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* June 20th. 305. (1941)].

The sedimentation rate is slowed down after the intake of food. The rate should therefore be always determined on fasting animals.—H. BLASCHKO.

NIKITIN, N. A. (1938). K voprosu ob issledovanii spinnomozgovoĭ zhidkosti (likvora) u zdorovykh ovets. [**Examination of the Cerebrospinal Fluid of Healthy Sheep**].—*Trud. vet. Fak. Vologda. sel'skokhoz. Inst.* **2.** 113–147.

The technique is described in detail of suboccipital, so-called cisternal puncture which is well tolerated by Suyag sheep which were used for the experiments, provided that precautionary measures are observed. Complications in the form of hemiplegia were observed in two out of 72 cases. 15–20 ml. can be taken without harm and puncture can be repeated. The following average values were found: specific gravity 1·007, surface tension 1·023, pH 7·35, protein content 22·5 mg.%, sugar 48·8 mg.%, mononuclear leucocytes 1·02–11·56 per cu. mm. Normal fluid gives a positive Speranski reaction and a negative Fridman colloid reaction. Age, sex, and pregnancy do not influence these values. A detailed review of the literature is given.—A. MOLDAWSKY.

*BARINSTEIN, L. A., & BABSKIJ, A. A. (1940). Eine neue beschleunigte Probe auf Verträglichkeit des Blutes. [**A New Rapid Direct Test for Compatibility of Blood for Transfusion Purposes**].—*Nov. chir. Arch.* **46.** 211–214. [Abst. from abst. in *Jber. Vet.-Med.* **68.** 106].

To collect serum without delay for use in the blood compatibility test, the authors drew the (human) blood into an equal amount of a solution containing 0·85% NaCl, 1% Na citrate, and 2% gum arabic, and allowed the tubes to stand for 1 min. for the erythrocytes to settle. They state that, in this solution, the fibrin separates into a layer above the erythrocytes so that the serum can be pipetted from the top layer. [The corpuscles of horse blood and buffalo blood settle fairly quickly in oxalated blood, but those of ox blood do not: this should be borne in mind in considering the behaviour of blood dealt with according to the technique now described.]—E. R. PARISER.

SOLIS, J. A. (1941). **A Preliminary Report on a New System for the Identification of Horses.**—*Philipp. J. anim. Indust.* **8.** 345–353.

Preliminary work on "less than 100 horses" suggests that hard palate impressions may be of value for identification purposes. The method consists of applying Gestetner duplicator ink by a pad to the palate and then taking impressions on duplicator paper pads. Representative results are illustrated. [From inspection of the illustrations showing consecutive prints from the same palate it appears that greater uniformity in the technique with regard to the ink deposit and print taking would be necessary before the method could be adopted on a large scale.]—J. E.

ISAKSSON, A., & JONSSON, G. (1941). Om Leverharpunering av häst och notkreatur som diagnostiskt hjälpmedel. [**Liver Sampling of Horses and Cattle during Life for Diagnostic Purposes**].—*Skand. VetTidskr.* **31.** 87–97. [English summary].

The authors describe Wall's operation (1931) by which a piece of tissue is removed for microscopic examination from the liver of the animal during life ("liver-harpooning"). The method has been practised in Sweden for the diagnosis of equine infectious anaemia and it has also been used in cattle. The same instruments have been used to recover tissue samples from the bovine udder.

The operation for liver puncture is described in detail. In the horse the harpoon is introduced through the fourth-last intercostal space on the right side just above the level of the lower border of the lung which is withdrawn from the path of the instrument by the slight pneumothorax artificially induced at one stage of the operation. Complications are rare. In a series of 500 punctures, one instance of bowel perforation occurred with fatal results. In 2% of 400 operations in the field, non-fatal internal haemorrhage occurred, probably

related to lung injury which was due to a faulty technique. Next to biological tests this is the most accurate method of diagnosis of E.I.A.

The operation in cattle is performed through the last intercostal space just below the extensor muscles of the spine.—G. B. BROOK.

MATA, E. G., & CANO, A. E. (1941). Inseminación artificial de ovinos en vasta escala. **[Artificial Insemination of Sheep on a Large Scale].**—*Rev. Med. vet., B. Aires.* **23.** 208–231.

The authors carried out artificial insemination in a flock of 6,300 sheep. Ewes in season were marked by the use of vasectomized rams which wore a belt carrying paint for the purpose. Ewes were separated from the flock daily, as found in oestrum, and inseminated. Semen was collected by the use of the artificial vagina, and diluted for use.

A number of photographs illustrates the various steps in the process.—MILLER WATSON.

WALLACE, F. G. (1942). **A Device for Administering Particulate Material to Mice.**—*J. Parasit.* **28.** 92–93.

The apparatus consists of a bottle of water with a two-hole rubber stopper fitted with a delivery tube and an air inlet. The delivery tube is connected to a glass or cellophane stomach tube by a foot of rubber tubing. A small bulb in the glass connexion to the stomach tube keeps the material to be administered (parasite cysts or larvae) concentrated in one place. Midway between the bottle and the stomach tube, a rubber tube with the end plugged and long enough to reach to the floor is connected to the delivery tube by a glass T. A small bunsen valve is inserted on either side of the T. A simple pump is then formed when the whole system is filled with water and all air bubbles are expelled. The infective material is then sucked up into the bulb and is locked in place by the valve until pressure is applied to the pump by stepping on the tube on the floor.

—M. L. BINGHAM.

MISCELLANEOUS

—. (1942). **Science and World Order. Transactions of a Conference of the Division for the Social and International Relations of Science. Report of the British Association for the Advancement of Science.** —*Advanc. Sci.* **2.** No. 5. pp. 119. London: British Association. [8vo] [5s.]

In a programme of broad scope and intense topical interest the British Association, at its conference in September 1941, discussed almost every aspect of social and economic reconstruction as it can be instituted or supported by science and scientific methods.

It is disappointing to note that veterinary science did not contribute to these discussions. Only one speaker pointed out the pressing importance, under the conditions of famine, poverty, and disease likely to prevail in many areas of the world when hostilities finally cease, of the reconstitution of depleted herds and the control of epizootics. Sir John RUSSELL, addressing the session on "Science and Post-War Relief", emphasized the practical difficulties to be mastered in any rapid expansion of animal populations, such as will have to be undertaken in those regions of Russia and Poland where the livestock has been slaughtered under the "scorched earth" policy. He suggested that stocks should be built up now in Great Britain and in America of those breeds which have given the best results in these areas or are known to be adaptable to them, ready for transportation at the earliest opportunity. A nucleus of good breeding animals and the careful use of artificial insemination would enable the repopulation of the farms to be started both more speedily and more soundly.

Nothing more appears to have been said at the conference about this essential aspect of reconstruction, which could best be planned and carried out by the trained veterinarian. There is a challenge here to the profession to mobilize its energies and resources, and to take its place with the other sciences in their attempt to make the necessities of life and health more widely accessible.—E. S.

KELSER, R. A. (1941). **Veterinary Service in the Defence Effort.**—*J. Amer. vet. med. Ass.* **99.** 455–461.

At the beginning of 1941 there were in the U.S.A. over 45,000,000 beef cattle, nearly 26,000,000 dairy cattle, about 53,000,000 pigs, and nearly 56,000,000 sheep; there were also about 11,000,000 horses and 4,000,000 mules. Over one-fifth of the population is engaged in the livestock industry. The role of the civilian veterinary profession in protecting the nation's supply of meat and dairy products constitutes an integral part of the defence effort.

When the present emergency started, the U.S. Army Veterinary Corps consisted of 126 regular officers and 590 men. In August, 1941, the figures had increased to 600 officers and 2,200 men. K. refutes the suggestion that as a result of the "blitz" character of the present type of warfare, the need for horses and mules in the army has been completely eliminated. He states that about 790,000 horses and mules are reported to have been used by the Germans in their campaign in Belgium and France, and 200,000 in Poland; these figures are contrasted with the 750,000 horses and mules which comprised the average strength of the combined allied armies in France and Flanders in 1914–18. Apart from his duties in connexion with sick and injured animals, the officer of the U.S. Veterinary Corps acts as inspector of meats, meat food, and dairy products. The Corps also conducts an extensive laboratory service for diagnostic and analytical purposes and for the production of biological products. Forage inspection is another important function of the service.—H. V. HUGHES.

MACGREGOR, R. (1941). **The Domestic Buffalo.**—*Vet. Rec.* **53.** 443–450.

An excellent account of the comparative zoological features of the domestic buffalo (*Buffelus asiaticus*) with notes on its anatomy and physiology. Examples of buffalo husbandry in Malaya and Italy are also given. Two varieties have been domesticated:– the swamp buffalo, which is practically identical with the wild Indian type, whose permanent habitat is mud swamps or marsh land, and the river type of buffalo which feeds and lives normally on dry ground and enters water only for bathing and sleeping. As a result of selective breeding for milk and work, a number of local breeds of the river buffalo have been developed in India and in the Mediterranean region. The swamp buffalo has not been subjected to artificial selection, and such differences as occur are due to geographical isolation. A very instructive survey of the special anatomical and physiological features of the domestic buffalo is dealt with under the following headings:– skeleton, musculature and fat, cutaneous system, circulatory and respiratory systems, digestive system, urinary and sexual systems, lactation, growth, sensory organs and temperament. With the draining and cultivating of swamp land, the buffalo tends to give place to the ox which is more profitable under the improved conditions. Nevertheless much land suitable only for the buffalo will remain, and

the author rightly concludes that attempts to improve the present strains by selective breeding are justified. —N. J. SCORGIE.

TARASOV, I. A. (1939). Itogi XII plenuma veterinarnoĭ sektsii akademii s.-kh. nauk im. V. I. Lenina. [**Review of the XIIth Plenary Session of the Veterinary Section of the Academy of Sciences of the U.S.S.R.**]—*Sovyet. Vet.* No. 3. pp. 57–65.

This is a short review of the papers presented at the meeting, on diagnosis, pathogenesis, and control of brucella infection in cattle, sheep, and horses. Most of the papers have appeared in subsequent numbers of the *Sovyet. Vet.* Of special interest are one paper by NICOLAEV, which deals with infertility in connexion with brucella infection, papers by VERSHILOVA, KOTLYAROVA, and LOKTEVA dealing with improved and new methods of diagnosis, and papers by BESSONOV, DERBEDENEV, and NIKOLAEV dealing with brucella infection in young animals.—A. MOLDAWSKY.

SOBOLEV, I. A. (1939). Ordzhonikidzevskaya nauchno-issledovatel'skaya veterinarnaya opytnaya stantsiya—uchastnik vsesoyusnoĭ s.-kh. vystavki. [**Veterinary Research Station in Piatigorsk**].—*Sovyet. Vet.* No. 9. pp. 11–13.

The history and development of the station are given as well as the field of research undertaken. One of the most important subjects was piroplasmosis in cattle; dipping in arsenic dips at five-day intervals is discussed.—E. R. PARISER.

OFFICIAL AND OTHER REPORTS

CANADA. (1939). **Report of the Minister of Agriculture for the Dominion of Canada for the Year ended March 31st, 1939.** pp. 138. Items of veterinary interest pp. 19, 37–40, 41–42 and 93–96. Ottawa: J. O. Patenaude. [8vo] [25 cents].

DIVISION OF ANIMAL PATHOLOGY.—This division includes the Animal Disease Research Institute at Quebec and four branch laboratories, at the Central Experimental Farm, Ottawa, at Lethbridge, Alta., at Saanichton, B.C., and at Milner, B.C.

For the diagnosis of JOHNE'S DISEASE johnin in the crude form is concentrated by ultrafiltration through cellulose membranes, the active factor precipitated, and the specific diagnostic agent so obtained in pure form. It is giving satisfactory results in experimental tests. The value of calfhood vaccination for the control of BOVINE CONTAGIOUS ABORTION was studied. The different types and strains of organisms responsible for infectious MASTITIS of cattle and the means of detecting infection were also studied. Work has been done on the differentiation of the species of *Salmonella* affecting animals and also on the influences of different temperatures on the agglutination test. Research work on EQUINE ENCEPHALOMYELITIS included investigations into the susceptibility of various animals and birds that might harbour the virus, the serological means of determining equine resistance, and the study of new strains. In the study of DISTEMPER in foxes and other fur-bearing animals, attempts have been made to reduce the mortality following the use of ferret virus-vaccine; the excretion of virus by animals so inoculated and the degree of immunity conferred has been considered. Investigations on BOVINE HAEMATURIA were continued. Field observations appear to indicate that cultivation, crop rotation, and the provision of cattle with pasture on cultivated lands lead to the disappearance of the disease. The cause of the condition is not known. LEUCOSIS in poultry has been studied, and work has continued on the survival of various species of poultry parasites under range conditions.

Biological products issued included tuberculin, mallein, johnin, distemper antiserum, *Brucella abortus* antigen, and *Salmonella pullorum* antigen. Under the diagnostic and miscellaneous services of the division, 175,150 specimens, carcasses, samples etc. were examined. Studies on various factors influencing the reduction time of methylene blue in milk were continued during the year.

HEALTH OF ANIMALS DIVISION.—The report of this division is given in greater detail in the report of the Veterinary Director General [see *V. B.* **11.** 913].

DIVISION OF ENTOMOLOGY.—Livestock insect pest investigation work continues to expand. Tick studies are growing in importance because of an increase in animal and human diseases due to tick transmission. Many cases of TICK PARALYSIS were reported in 1938 in sheep and cattle, as well as one fatal human case. Tick surveys are being made and new data accumulated. In British Columbia, 70 species of fleas from 80 hosts have so far been reported. Mosquito control was carried out in British Columbia. Tests of mosquito repellents showed that pyrethrum extract and oil of thyme in castor or olive oil were superior to other preparations tested. Warble-fly control measures are being extended.—J. A. GRIFFITHS.

CANADA. PROVINCE OF BRITISH COLUMBIA. (1941). **Thirty-Fifth Annual Report of the Department of Agriculture for the Year 1940.** Items of veterinary interest pp. H70–H74, H77–H80 and H118–H119. Victoria, B.C.: Govt. Printer. [4to].

Strain 19 vaccine for calf vaccination against BRUCELLOSIS was not then being used. HAEMORRHAGIC SEPTICAEMIA was confined to beef herds. The use of a bacterin controlled the disease. TUBERCULOSIS eradication work continues. The provincial staff tested 7,008 cattle and found 19 reactors including 12 in one herd; the others were in cattle imported from Alberta; these reactors were slaughtered and the carcasses buried or burnt. The federal service tested 18,255 cattle and found 123 reactors (under 0·68%). In the inspection of dairy premises, containing 67,000 cattle, 585 were graded "A", 2,845 "B", and 153 "C", while 493 were ungraded. Two tables give details of the figures quoted. There were five cases (four fatal) of EQUINE ENCEPHALOMYELITIS. Vaccination is in use by some owners, but there is apparently no legislative compulsion.

HELMINTHIASIS in pigs and sheep was usually confined to animals kept on infected pastures or in infected premises. Animals on the range are comparatively free from infection. Losses among horses are also attributed to helminths, but details of the types involved are not given. Work was done on the control of warble flies and ticks. The 24,571 cattle treated were estimated to have a total of 54,667 warbles. *Dermacentor andersonii* (the wood-tick) and *Dermacentor albopictus* (the winter tick) are still being controlled by the use of a standardized derris which is, so far, considered the most practical method of control. Research is, however, in progress on other methods of controlling these ticks.

The legume, *Astragalus campestris*, has been shown by BRUCE to be the cause of the condition known as "knock-heel" in cattle. Further research is being carried out to trace deficiency factors in the soil, water, and plants of the range.

The value of wheat germ oil was tested on 40 cows of a herd of 125 dairy cattle. Good results are reported.

Calves born after treatment of the cows were sturdier and more resistant to the usual calf affections. There was a reduction in the number of retained placentas and breeding results were improved.

Some details are given on poultry diseases.—J. A. G.

CANADA. PROVINCE OF NOVA SCOTIA. (1940). **[Report of] Animal Pathology Division [1939].**—*Rep. Dep. Agric. Nova Scotia, 1939.* pp. 84–86.

Laboratory work is carried on at the Agricultural College, Truro. It included blood testing of poultry for PULLORUM DISEASE and P.M. examinations of 132 poultry, 22 mink and foxes, 3 pigs, 5 sheep, and one horse.

INFECTIOUS BRONCHITIS of chicks caused heavy mortality in many flocks. Other diseases were LEUCOSIS, COCCIDIOSIS and intestinal HELMINTHIASIS. Some failures in sheep farming were found to be due to losses caused by untreated helminth infestations. ANAEMIA of unweaned piglets from birth up to 3–4 weeks of age was prevalent. There were no serious outbreaks of cattle disease. Mineral deficiency disorders were reported.

The second general test under the restricted area plan for TUBERCULOSIS eradication is proceeding favourably. The tests are being carried out by the Federal Health of Animals Division.—J. A. GRIFFITHS.

BASUTOLAND. (1940). **[Report of] Veterinary and Livestock Division [1939-40].**—*Rep. Dep. Agric. Basutoland, 1939–40.* pp. 9–12.

The report is in an abbreviated form. The number of the staff remained the same as the previous year. The year was regarded as a very successful one. Livestock improvement schemes were producing good results.

The main features of disease control work were as follows. There was only one outbreak of ANTHRAX (three deaths); 27,938 cattle were immunized. BLACKLEG losses are increasing; prophylactic treatment is apparently not compulsory but is becoming more popular, and 6,576 cattle were immunized. 659 cattle were immunized against ANAPLASMOSIS. 165 horses were immunized against AFRICAN HORSE SICKNESS. All outbreaks of BLUE TONGUE (CATARRHAL FEVER) were confined to the lowlands and the mortality was slight; a few farmers make use of preventive inoculation. WIREWORM treatment is compulsory; monthly dosing is under official supervision. 8,258,022 doses were given to sheep and 3,399,793 to goats. Treatment for external parasites was given to 78,512 sheep, 17,185 goats, and 223 horses. Castrations by officers of the department were :– equine animals 988; cattle 2,229, sheep 20,154, and goats 6,619.

The census of livestock for the year shows :– sheep 1,597,887, goats 565,554, cattle 470,040, horses 88,272, mules 1,111, and donkeys 29,829.—J. A. GRIFFITHS.

NORTHERN RHODESIA. (1941). **Veterinary Department. Annual Report for the Year 1940.** [MORRIS, J. P. A.] pp. 11. Lusaka: Govt. Printer. [fcp] [1s.]

LIVESTOCK INDUSTRY.—The position generally was satisfactory, the most noteworthy feature being the success of the composite veterinary staff in the anti-RINDERPEST campaign in the south of Tanganyika, resulting in the effective checking of the southward spread of the disease into Northern Rhodesia. Stock imported for breeding numbered 164. 6,802 slaughter stock were imported from Bechuanaland and 950,000 lb. of frozen meat from Southern Rhodesia.

ANIMAL DISEASES.—CONTAGIOUS ABORTION is enzootic. Fourteen outbreaks of ANTHRAX and 65 of BLACKLEG were recorded. Most European stock owners practise annual prophylactic vaccination for these diseases. Outbreaks of BLACKLEG in native reserves showed considerable increase and the disease attacked both older cattle and calves of 2–3 months old. It was proposed to erect permanent kraals and crush pens in the reserves and to undertake collective prophylactic vaccination at intervals. Two herds were found to be affected with BOVINE TUBERCULOSIS in the Fort Jameson district. No reactors to the tuberculin test were detected in imported breeding stock in 1940. There was a decline in the incidence of STREPTOTHRICOSIS. Several cases of "TICK PYAEMIA" in horses were seen. Eighteen outbreaks of ANAPLASMOSIS and six of BOVINE PIROPLASMOSIS were reported. Trypan blue and acaprin were both successful in the treatment of BOVINE and CANINE PIROPLASMOSIS. There was little change in the tsetse fly position; an outbreak of TRYPANOSOMIASIS involving 3,000 cattle was effectively dealt with by the administration of seven injections of tartar emetic to the whole herd. Infection had probably been introduced by trek oxen, transmission being mechanical. BOVINE CONTAGIOUS PLEURO-PNEUMONIA remained confined to the Barotse Province where the campaign for eradication by vaccination [see *V. B.* **11.** 340.] was continued. 237,397 inoculations were carried out; mortality had decreased and the calf crop was much improved. All clinically active cases were slaughtered. The Colony remained free from FOOT AND MOUTH DISEASE and only one case of MALIGNANT CATARRH was reported. Sixty-three outbreaks of HEARTWATER occurred, the disease being responsible for great losses, especially in pure-bred and grade animals. SWEATING SICKNESS of calves was common, no effective treatment being known. Twelve outbreaks of RABIES were reported, but no case occurred in human beings. One fatal case of AFRICAN HORSE SICKNESS occurred in an animal vaccinated some time previously. FOWL POX occurred sporadically and FOWL TYPHOID caused heavy mortality in native-owned poultry.

REPORT OF THE VETERINARY RESEARCH OFFICER.—The V.R.O. was engaged for much of the year on immunization of cattle against RINDERPEST in the Northern Province. Little investigational work could therefore be conducted and this report is largely devoted to general observations concerning diseases and conditions in the Colony.

The immune belt created in 1938 by the triple vaccination against RINDERPEST of all cattle between the Central Railway and the Ruaha river in Tanganyika did not stop the southward spread of the disease. A campaign of immunization of all stock in the northern areas of Northern Rhodesia and Nyasaland and of eradication of rinderpest from Southern Tanganyika was instituted, the Union of South Africa, Southern and Northern Rhodesia contributing respectively £25,000, £15,000, and £10,000 towards the cost of the campaign. Vaccinations began late in 1939.

> "the campaign . . . was proceeded with and the inoculation of hundreds of thousands of animals successfully completed in record time. This is evidently the largest inoculation campaign ever attempted in the World and proves what can be achieved when funds and staff are available. The much dreaded spread of Rinderpest from the North has been removed, at least for a while."

[A very significant statement. Colonial veterinary services have been sadly hampered by lack of funds and staff and little real progress can be made until this is rectified.]

Cattle in the Northern Province were inoculated with a formol-glycerin-spleen virus in preparation for active immunization at a later date. Experiments with attenuated goat virus on highly susceptible cattle were carried out at Shiwa Ngandu with a view to finding out the best means of immunizing the highly graded herds in the south, if this should become necessary.

Actual losses from diseases such as SWEATING SICKNESS, THREE-DAY-SICKNESS, HELMINTHIASIS, OPHTHALMIA, etc., were considerable and the great wastage resulting from these diseases is the reason for the low herd percentage available for slaughter each year.

The bont-leg tick (*Hyalomma aegyptium*), caused much damage, sites of its "bites" invariably becoming fly-blown. This species is not readily controlled by seven-day dipping even when the 14–day strength dip is used.

"BACK WEAKNESS" in animals in a Sussex herd, and on ranches where Sussex bulls had been used, was thought to be of genetic origin. The condition was being investigated. Work on the improvement of the indigenous herds by selective breeding was commenced. Checking the deterioration of stock in overstocked areas was a very difficult problem and legislation would be necessary to limit numbers of cattle. Improvement of stock could not be recommended until the more serious diseases had been effectively controlled.

Observations on tick control showed that regularly dipped stock running in paddocks which had been burnt before the rains, remained relatively free from ticks. If burning was neglected the cattle returned weekly to the dip smothered in ticks.

Some notes on helminth species affecting cattle and game are included. ONCHOCERCOSIS is very common in cattle in the Colony, but no filariae have been found in thousands of blood smears examined during the past ten years.—H. E. HARBOUR.

—. (1941). **Report of the 24th Annual Congress of the Philippine Veterinary Medical Association.**—*Philipp. J. anim. Indust.* **8.** No. 3. 187–312.

The president of the Association (Dr. V. FERRIOLS) gave an account of the founding and development of veterinary education in the Philippine Islands: this began in 1910 with the establishment of a veterinary school as an adjunct of the university of the Philippines. By 1935 when the country was given full independence the State veterinary service was completely Filipinized. The main achievements of the service include the eradication of rinderpest, the manufacture of biological products required for disease control, the establishment of an effective research staff, of a meat inspection service, and of a livestock improvement service. The Secretary of Agriculture and Commerce reviewed the agricultural and livestock conditions and indicated the chief needs, which include an expansion in the food animal industries, with which is linked the need for disease control. Various committees submitted reports on current problems of importance, as follows.

ANTHRAX.—A table shows the number of cases and deaths and the number of animals vaccinated from 1922–40. Except for 1923 (over 9,000 cases), 1924 (nearly 4,000 cases) and 1937 (1,500 cases) losses have been low. The need for an anthrax survey and for mass annual vaccination in infected areas is stated. A spore vaccine is in use.

GLANDERS.—Out of 131 horses tested in 1940, only 12 yielded positive reactions.

CONTAGIOUS ABORTION.—This occurs in swine. A segregation scheme is recommended to control it. [Brucella infection is apparently the cause.] Bovine brucellosis is not known to exist in Philippine cattle.

FOOT AND MOUTH DISEASE.—This was prevalent during the latter half of 1939 and early in 1940, mainly in central Luzon. Over 33,000 cases in water buffaloes and close on 3,000 in cattle were observed. The disease was mild and only 26 buffaloes and five cattle died. Control by quarantine was effective in localizing the disease. The use of artificial infection and of serum inoculation in animals in an infected area is suggested as a possible additional future control measure.

SWINE FEVER.—This disease is the main menace to the expanding pig industry. In 1940, 2,566 cases were officially noted and 5,862 pigs were given serum-virus immunization. 441 pigs were condemned for S.F. at meat inspection. The difficulties of control are discussed and mention is made of preliminary trials with crystal-violet vaccine.

Technical points arising out of these reports were discussed. Papers were presented on animal production, on the possible development of a buffalo-meat packing industry, and on sarcoptic mange in buffaloes [for an article on the latter, see *V. B.* **12.** 454].—J. E.

BOOK REVIEWS

ENGELBRETH-HOLM, J. [M.D., Director of the Cancer Research Laboratory of the Danish Anti-Cancer League; Chief Pathologist of the Finsen Institute and Radium Station of Copenhagen]. (1942). **Spontaneous and Experimental Leukaemia in Animals.** pp. xxiii + 245. 44 figs. Edinburgh: Oliver & Boyd Ltd. [8vo] [15s.] [Translated from the Danish by C. L. HEEL].

This monograph, written at the invitation of the Scientific Advisory Committee of the Lady Tata Memorial Trust, presents a survey of existing knowledge of spontaneous and experimental leucaemia in animals. The author has contributed much of value to the subject and is well qualified to assess critically the very extensive literature which has accumulated during recent years. The Danish manuscript was prepared in 1940 and the Committee has incorporated in the English text a number of more recent contributions to the subject.

Spontaneous leucaemia in animals is dealt with in the first 50 pages, the animals considered being birds, dogs, pigs, cattle, and rodents. The second part of the book deals with transmission experiments with avian and mammalian leucaemia. In part 3 the role of heredity in relation to spontaneous and experimental leucaemia is discussed and part 4 describes attempts to produce leucaemia by experimental procedures of various kinds. A final chapter is devoted to the various views as to the nature of leucaemia and the relation between this condition in man and in animals.

The text is illustrated by 44 figures, most of which are photomicrographs prepared by the author. There is an extensive bibliography of over 400 references. The translator has achieved outstanding success in his share of this work. The presentation is strikingly clear and could serve as a model for authors of scientific papers.

The first part of the book is of especial interest to veterinarians and the whole is written in a style easily understood and enjoyed by the general reader. For the research worker this monograph will prove invaluable as a summary of the present state of knowledge and as a basis for planning future research.—E. G. WHITE.

PINEY, A. [M.D., M.R.C.P., Physician, St. Mary's Hospital for Women and Children, London. Late Director of the Pathological Institute, Charing Cross Hospital]. (1941). **Sternal Puncture. A Method of**

Clinical and Cytological Investigation. pp. 77. 1 appendix. London: William Heinemann (Medical Books) Ltd. [8vo] [12s. 6d.]

By means of sternal puncture, active myeloid tissue may be obtained at frequent intervals during life and this provides a technique by which the composition of the main formative tissue can be examined. The myelogram or marrow picture enables exact study of the life-history of the blood to be furthered and advances to be made in problems in haematology; also reactions of the formative elements of the blood to infections and other morbid states, such as enlargements of the liver and spleen and pathological bone changes, can be observed. In this well set out monograph the normal myelogram is described and in subsequent chapters the marrow picture in various pathological disorders is discussed. The leucaemias, tumours of the bone marrow, the anaemias, erythraemia, and allied states, are dealt with, together with certain infective diseases. Brief mention is also made of the possible use of the myelogram in some protozoal diseases. In an appendix the technique of sternal puncture in human beings is described.—R. ALLCROFT.

DRINKER, C. K. [M.D., D.Sc., Professor of Physiology, School of Public Health, Harvard University], & YOFFEY, J. M. [M.Sc., M.D., F.R.C.S. (Eng.) Senior Lecturer in Anatomy, University College of South Wales and Monmouthshire, Cardiff, Wales]. (1941). **Lymphatics, Lymph, and Lymphoid Tissue. Their Physiological and Clinical Significance.** pp. ix + 406. 50 figs. London: Humphrey Milford, Oxford University Press; Cambridge, Mass.: Harvard University Press. [8vo] [$4·00].

In some ways this book serves as a new edition of the monograph by DRINKER & FIELD published in 1933: it is, however, more than that for it includes an excellent account of lymphoid tissue, which was not dealt with in the former monograph, and it abounds in valuable information dealing with the practical clinical significance of the lymphatic apparatus. Professor Yoffey, who since the publication of this book has taken the chair of anatomy at the University of Bristol, is particularly well qualified to deal with the subject of lymphoid tissue for it is a subject which he has made his own for some years and to which he has made many valuable contributions.

Of the nine chapters which make up the work the senior author is responsible for five concerning permeability of blood capillaries and its relation to lymph formation, permeability of lymphatics, lymph flow and lymph pressure, characters and composition of lymph, and "practical considerations". YOFFEY contributes three chapters dealing with lymphoid tissue, lymph, and the lymphocyte. Both authors collaborated in writing the first chapter which deals with the anatomical and physiological organization of the lymphatic system in the animal kingdom.

The significance of lymphoid tissue and its suggested value as a defence mechanism is discussed at some length. Perhaps the following quotations sum up the authors' review of the problem.

"One may, in fact, argue plausibly both for and against intestinal lymphoid tissue as a defence mechanism; but with our present knowledge we cannot settle the issue" (p. 176),

or, again, in mentioning the spread of carcinoma from the primary site and of bacteria from a septic wound,

". . . as far as barrier action is concerned, the patient would perhaps be better off had he possessed neither lymphatic vessels nor nodes" (p. 175).

In the case of viruses it appears that the lymph nodes are very inefficient filters.

"In fact the lymph node may be a source of danger rather than of safety, since it may actually serve as a center for their diffusion throughout the body" (p. 189).

The striking perivascular accumulation of lymphocytes seen in many virus diseases is usually regarded as a reaction of the tissues to the virus. Yoffey asks whether the accumulation of virus-containing lymphocytes may not be responsible for first bringing virus to the area: in the case of vaccinia he has shown that the virus is "fixed" by lymphocytes.

The final chapter dealing with practical considerations covers such subjects as circulatory oedema and the sluggishness of lymph drainage, acute inflammation, chronic lymphatic obstruction, failure of antiserum injected intravenously to reach the lymph and tissue fluid, and therapeutic measures to increase lymph flow, etc. This short chapter will be of special value to clinicians.

For those specially interested in the subject there is a bibliography of about 700 references, as well as numerous diagrams, charts and tables. It should again be stressed, however, that this is not a monograph of value merely to the research worker: it contains a wealth of material which can be used to advantage by both research worker and clinician and which gives much food for thought on such controversial problems as the functions of lymphoid tissue and the origin and fate of the lymphocyte.—E. G. WHITE.

HALDANE, J. B. S. [F.R.S., Weldon Professor of Biometry in the University of London]. (1941). **New Paths in Genetics.** pp. 206. 17 figs. London: George Allen & Unwin Ltd. [8vo] [7s. 6d.]

Genetics can no longer be regarded as a rather academic study, independent of any relation to the main fields of biological study. In this book, based on a series of lectures given in the University of Gröningen in 1940, Professor Haldane seeks to show the relation of genetics to other sciences, and some of the lines along which it is advancing. Probably his main thesis is the intimate relation between biochemistry and genetic study.

In the first chapter, the author reviews the general scope of genetics and points to its application and its possibilities in the future development of crop breeding, arboriculture, horticulture, animal breeding and medicine. In the social and political sphere its implications are briefly and impartially examined. Emphasis is rightly laid on the realization that the gene should now be regarded as being responsible for a unit process rather than for a unit character. This leads in chapter II to a consideration of recent advances which have been made regarding the biochemistry of several congenital diseases of human metabolism, and of the genetical determination of difference of colour in plants and animals. Chapter III is concerned with a survey of developmental genetics, with special reference to the mouse and the rat. The bearing of these studies on the investigation of human congenital diseases is explained. Chapters IV and V deal with the genetics of some human abnormalities and the formal genetics of man.

The author and his co-workers are responsible for much of the recent advances described in this book. He has succeeded in expounding them in a lucid and understandable way for the non-specialist in genetics, and the veterinary reader will find that this book opens up new perspectives in his own particular field of inquiry.—N. J. SCORGIE.

3348—Wt.P516-Dd.176—750—9/42—H. R. G. Ltd.—G.13

Printed under the authority of His Majesty's Stationery Office by H. R. GRUBB, LTD., Croydon

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

As each half-yearly issue consists of a single complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Each number contains the indexing done by the Bureau during the previous half-year, *i.e.*, No. 1, issued in December, covers the indexing done during the previous January to June.

The dates of issue of the two numbers of each volume are as follows:—

No. 1.—Issued December.	Indexing period previous January—June.
No. 2.—Issued June.	Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed.

Vols. 1 to 5 were issued in quarterly parts; the issue is now half-yearly.

Annual Subscription, £5.

A limited number of copies printed on one side only are available for those who wish to mount references on cards.

Orders may be sent to:—

CENTRAL SALES BRANCH,
(IMPERIAL AGRICULTURAL BUREAUX),
AGRICULTURAL RESEARCH BUILDING,
PENGLAIS,
ABERYSTWYTH,
WALES.

Imperial Bureau of Dairy Science

Shinfield, Reading, England

DAIRY SCIENCE ABSTRACTS

A comprehensive collection of abstracts of current literature dealing with milk and dairy products: husbandry, technology, control and standards, economics, physiology, bacteriology and mycology, chemistry and physics. Published quarterly. Subscription 25s. per volume of 4 numbers (5s. discount to British subjects who subscribe direct): single copies, 7s. 6d.

Technical Communications

No. 1. The phosphatase test for control of efficiency of pasteurisation. H. D. Kay, R. Aschaffenburg and F. K. Neave. Price 2s. (postage 2d. extra).

Imperial Bureau of Animal Nutrition

Rowett Institute, Aberdeen, Scotland

NUTRITION ABSTRACTS AND REVIEWS

Consists of abstracts of papers published throughout the world dealing with the subject of nutrition in all its aspects. They are arranged under the following sections: technique (including chemical and experimental methods), composition of food, physiology of nutrition, human diet in relation to health and disease (including dietary studies, food economics, deficiency diseases and therapeutic dietetics), feeding of animals and book reviews. Each issue also contains a review article on some subject of general interest.

Published quarterly. Annual subscription 42s.

Technical Communications

These are published at irregular intervals; lists and prices on application.

Imperial Bureau of Animal Breeding and Genetics

King's Buildings, University of Edinburgh

ANIMAL BREEDING ABSTRACTS

This journal contains abstracts and reviews of current publications bearing on animal breeding, genetics, production, sex physiology, reproduction and cognate subjects. Published quarterly. Subscription rate, 25s. per annum.

Occasional Communications and *Bibliographies* are also issued from time to time.

Imperial Bureau of Pastures and Forage Crops

Agricultural Research Building, Penglais, Aberystwyth

This Bureau covers current literature on grassland, forage crops and plant biological research, and issues two quarterly publications:—

HERBAGE ABSTRACTS and HERBAGE REVIEWS

The latter publication contains original articles and reviews on topics which merit more detailed consideration than can be given in the former.

Subscription rates: *HERBAGE ABSTRACTS*. 25s. per annum (single parts, 7s.).
HERBAGE REVIEWS. 15s.* per annum (single parts, 4s.).

*A reduction of 5s. will be made when *HERBAGE ABSTRACTS* is also ordered.

At irregular intervals larger monographs are published on miscellaneous subjects in the form of *Bulletins*.

All correspondence regarding subscriptions to journals and sales of occasional publications should henceforth be addressed to: Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

Printed in Great Britain by H. R. Grubb, Ltd., Croydon.